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July 2006







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Mapur Patricia L. Hogun

RESOLUTION ADOPTING A NATURAL HAZARDS MITIGATION PLAN FOR WEST PIEDMONT FLANNING DISTRICT COMMUNITIES

WHEREAS, THE Diseaser Mitigation Act of 2000, as amended, requires that local governments develop and adopt natural hazard mitigation plans in order to receive certain federal assistance, and

WHEREAS, a Mitigation Advisory Committee (MAC) comprised of representatives from the counties of Franklin, Henry, Patrick and Pittsylvania; the cities of Danville and Martineville; and the towns of Chatham, Boones Mill, Gretna, Hurt, Ridgeway, Rocky Mount and Stuart was convened in order to study the West Piedmont Region's risks from and vulnerabilities to natural hazards, and to make recommendations on mitigating the effects of such hazards on the West Piedmont Region; and

WHEREAS, a request for proposals was issued to hire an experienced consulting firm to work with the MAC to develop a comprehensive natural hazard mitigation plan for the West Piedmont Planning District; and

WHEREAS, the efforts of the MAC members and the consulting firm of Dewberry, in consultation with members of the public, private and non-profit sectors, have resulted in the development of a Hazard Mitigation Plan for the West Piedmont Planning District including the Town of Boones Mill.

NOW THEREFORE, BE IT RESOLVED by the Town Council of the Town of Boones Mill that the Hazard Mitigation Plan dated March 2006 is hereby approved And adopted for the Town of Boones Mill. A copy of the plan is attached to this resolution.

ADOPTED BY THE Town of Boones Mill, this 11th day of July, 2006.

Approved:

Lynn G Frith, Town Manager

COUNCIL OF THE TOWN OF CHATHAM RESOLUTION JUNE 12, 2006

RESOLUTION ADOPTING A NATURAL HAZARDS MITIGATION PLAN FOR WEST PIEDMONT PLANNING DISTRICT COMMUNITIES:

WHEREAS, the Disaster Mitigation Act of 2000, as amended, requires that local governments develop and adopt natural hazard mitigation plans in order to receive certain federal assistance; and

WHEREAS, a Mitigation Advisory Committee ("MAC") comprised of representatives from the counties of Franklin, Henry, Patrick and Pittsylvania; the cities of Danville and Martinsville; and the towns of Chatham, Boones Mill, Gretna, Hurt, Ridgeway, Rocky Mount and Stuart was convened in order to study the West Piedmont Region's risks from and vulnerabilities to natural hazards, and to make recommendations on mitigating the effects of such hazards on the West Piedmont Region; and

WHEREAS, a request for proposals was issued to hire an experienced consulting firm to work with the MAC to develop a comprehensive natural hazard mitigation plan for the West Piedmont Planning District; and

WHEREAS, the efforts of the MAC members and the consulting firm of Dewberry, in consultation with members of the public, private and non-profit sectors, have resulted in the development of a Hazard Mitigation Plan for the West Piedmont Planning District including Pittsylvania County.

NOW THEREFORE, BE IT RESOLVED by the Council of the Town of Chatham that the Hazard Mitigation Plan dated March 2006 is hereby approved and adopted for the Town of Chatham. A copy of the plan is attached to this resolution.

Given under my hand this 12th day of June 2006.

George O. Haley, Mayor

David Cothran, Clerk of Council

PRESENTED: May 16, 2006

May 16, 2006

ADOPTED:

RESOLUTION NO. 2006- 05 .07

A RESOLUTION ADOPTING THE WEST PIEDMONT MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN FOR WEST PIEDMONT PLANNING DISTRICT COMMUNITIES.

WHEREAS, the Disaster Mitigation Act of 2000, as amended, requires that local governments develop and adopt natural hazard mitigation plans in order to receive certain federal assistance; and

WHEREAS, a Mitigation Advisory Committee ("MAC") comprised of representatives from the Counties of Franklin, Henry, Patrick and Pittsylvania; the Cities of Danville and Martinsville; and the towns of Chatham, Boones Mill, Gretna, Hurt, Ridgeway, Rocky Mount and Stuart was convened in order to study the West Piedmont Region's risks from and vulnerabilities to natural hazards, and to make recommendations on mitigating the effects of such hazards on the West Piedmont Region; and

whereas, a request for proposals was issued to hire an experienced consulting firm to work with the MAC to develop a comprehensive natural hazard mitigation plan for the West Piedmont Planning District; and

WHEREAS, the efforts of the MAC members and the consulting firm of Dewberry, in consultation with members of

DFFICE OF THE CITY ATTORNEY CITY OF DANVILLE, VIRGINIA the public, private and non-profit sectors, have resulted in the development of a Hazard Mitigation Plan for the West Piedmont Planning District, including the City of Danville.

NOW THEREFORE, BE IT RESOLVED by the Council of the City of Danville, Virginia, that the West Piedmont Multi-Jurisdictional Hazard Mitigation Plan dated March 2006, is hereby approved and adopted for the City of Danville, and a copy of said plan shall be recorded in the office of the City Clerk and Director of Planning.

APPROVED:

MAYOR

ATTEST:

Amalu A Clanu, CINC

Approved as to Form and legal Sufficiency:

City Attorney



THE FRANKLIN COUNTY BOARD OF SUPERVISORS HELD THERE REGULAR MONTHLY MEETING ON TUESDAY, MAY 16TH, 2006, AT 1:30 P.M., IN THE BOARD OF SUPERVISORS MEETING ROOM IN THE COUNTY COURTHOUSE.

THERE WERE PRESENT Wayne Angell, Chairman

Charles Wagner, Vice-Chairman

Leland Mitchell David Hurt

Charles Poindexter Russ Johnson Hubert Quinn

OTHERS PRESENT: Richard E. Huff, II, Co. Administrator

Bonnie N. Johnson, Asst. County

Administrator

Christopher L. Whitlow, Asst. County

Administrator

B. J. Jefferson, County Attorney Sharon K. Tudor, CMC, Clerk

MODEL RESOLUTION ADOPTING A NATURAL HAZARDS MITIGATION PLAN FOR WEST PIEDMONT PLANNING DISTRICT COMMUNITIES:

WHEREAS, the Disaster Mitigation Act of 2000, as amended, requires that local governments develop and adopt natural hazard mitigation plans in order to receive certain federal assistance, and

WHEREAS, a Mitigation Advisory Committee ("MAC") comprised of representatives from the counties of Franklin, Henry, Patrick and Pittsylvania; the cities of Danville and Martinsville; and the towns of Chatham, Boones Mill, Gretna, Hurt, Ridgeway, Rocky Mount and Stuart was convened in order to study the West Piedmont Region's risks from and vulnerabilities to natural hazards, and to make recommendations on mitigating the effects of such hazards on the West Piedmont Region; and

WHEREAS, a request for proposals was issued to hire an experienced consulting firm to work with the MAC to develop a comprehensive natural hazard mitigation plan for the West Piedmont Planning District; and

WHEREAS, the efforts of the MAC members and the consulting firm of Dewberry, in consultation with members of the public, private and non-profit sectors, have resulted in the development of a Hazard Mitigation Plan for the West Piedmont Planning District including (County name).

NOW THEREFORE, BE IT RESOLVED by the Franklin County Board of Supervisor's that the Hazard Mitigation Plan dated March 2006 is hereby approved and adopted for the Franklin County. A copy of the plan is attached to this resolution.

ADOPTED by Franklin County this 16th, day of May, 2006.

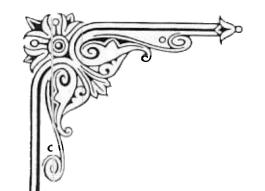
APPROVED:

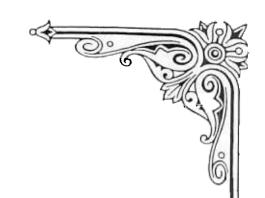
Chairman, Board of Supervisor

W. Wayne Angel

Sharon K. Tudor, CMC Clerk of the County RICHARD E. HUFF II
COUNTY ADMINISTRATOR
40 EAST COURT STREET
ROCKY MOUNT, VIRGINIA 24151
(540) 483-3030

www.franklincountyva.org





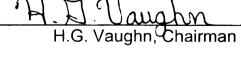
RESOLUTION OF THE HENRY COUNTY BOARD OF SUPERVISORS

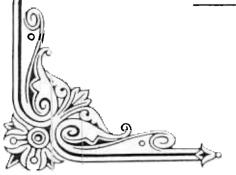
WHEREAS, the Disaster Mitigation Act of 2000, as amended, requires that local governments develop and adopt natural hazard mitigation plans in order to receive certain federal assistance, and

WHEREAS, a Mitigation Advisory Committee ("MAC") comprised of representatives from the counties of Franklin, Henry, Patrick and Pittsylvania; the cities of Danville and Martinsville; and the towns of Chatham, Boones Mill, Gretna, Hurt, Ridgeway, Rocky Mount and Stuart was convened in order to study the West Piedmont Region's risks from and vulnerabilities to natural hazards, and to make recommendations on mitigating the effects of such hazards on the West Piedmont Region; and

WHEREAS, the efforts of the MAC members and the consulting firm of Dewberry, in consultation with members of the public, private and non-profit sectors, have resulted in the development of a Hazard Mitigation Plan for the West Piedmont Planning District including Henry County;

NOW THEREFORE, BE IT RESOLVED on this 25th day of April, 2006 by the Henry County Board of Supervisors that the Hazard Mitigation Plan dated March 2006 is hereby approved and adopted for the County of Henry.





The Town of Hurt

Incorporated In 1967



HURT, VIRGINIA 24563-0760

P.O. Box 760 533 Pocket Road

Phone 434-324-4411 FAX 434-324-9247

Resolution adopting a natural hazards mitigation plan for West Piedmont Planning District Communities:

WHEREAS, the Disaster Mitigation Act of 2000, as amended, requires that local governments develop and adopt natural hazard mitigation plans in order to receive certain federal assistance, and

WHEREAS, a Mitigation Advisory Committee ("MAC") comprised of representatives from the counties of Franklin, Henry, Patrick and Pittsylvania; the cities of Danville and Martinsville; and the town of Chatham, Boones Mill, Gretna, Hurt, Ridgeway, Rocky Mount and Stuart was convened in order to study the West Piedmont Region's risks from and vulnerabilities to natural hazards, and to make recommendations on mitigating the effects of such hazards on the West Piedmont Region; and

WHEREAS, a request for proposals was issued to hire an experienced consulting firm to work with the MAC to develop a comprehensive natural hazard and mitigation plan for the West Piedmont Planning District; and

WHEREAS, the efforts of the MAC members and the consulting firm of Dewberry, in consultation with members of the public, private and non-profit sectors, have resulted in the development of a Hazard Mitigation Plan for the West Piedmont District including the Town of Hurt.

NOW THEREFORE, BE IT RESOLVED by the Town Council that the Hazard Mitigation Plan dated March 2006 is hereby approved and adopted for the Town of Hurt. A copy of the plan is attached to this resolution.

APOPTED by the TOWN OF HURT this ________, day of __________, 2006.

APPROVED:

Bobby Krantz, Mayor

ATTEST

Clerk. Town of Hurt



107 SOUTH SHELTON ST. P.O. BOX 602 GRETNA, VIRGINIA 24557

PHONE 434-656-6572 FAX 434-656-6572 EMAIL: tog1@pmtnet.net

TOWN OF GRETNA RESOLUTION ADOPTING A NATUAL HAZARDS MITIGATION PLAN FOR WEST PIEDMONT PLANNING DISTRICT COMMUNITIES:

WHEREAS, the Disaster Mitigation Act of 2000, as amended, requires that local governments develop and adopt natural hazard mitigation plans in order to receive certain federal assistance, and

WHEREAS, a Mitigation Advisory Committee ("MAC") comprised of representatives from the counties of Franklin, Henry, Patrick and Pittsylvania; the cities Danville and Martinsville; and the towns of Chatham, Boones Mill, Gretna, Hurt, Ridgeway, Rocky Mount and Stuart was convened in order to study the West Piedmont Region's risks from and vulnerabilities to natural hazards, and to make recommendations on mitigating the effects of such hazards on the West Piedmont Region; and

WHEREAS, a request for proposals was issued to hire an experienced consulting firm to work with the MAC to develop a comprehensive natural hazard mitigation plan for the West Piedmont Planning District; and

WHEREAS, the efforts of the MAC members and the consulting firm of Dewberry, in consultation with members of the public, private and non-profit sectors, have resulted in the development of a Hazard Mitigation Plan for the West Piedmont Planning District including the Town of Gretna.

NOW THEREFORE, BE IT RESOLVED by the Gretna Town Council that the Hazard Mitigation Plan dated June 2005 is hereby approved and adopted for the Town of Gretna. ADOPTED by the Town of Gretna this 10th day of April 2006.

APPROVED:

Blenna J. Lingafelt
Mayor, Town of Gretna

ATTEST:

Clerk/Treasurer, Town of Gretna

Council Members
Joseph R. Cobbe, Mayor
Kimble Reynolds, Jr., Vice-Mayor
James W. Clark
J. Ronald Ferrill
Terry L. Roop



City Manager
Robert R. Collins
City Attorney
Eric H. Monday
Clerk of Council
Susan N. Johnson

RESOLUTION

WHEREAS, the Disaster Mitigation Act of 2000, as amended, requires that local governments develop and adopt natural hazard mitigation plans in order to receive certain federal assistance; and

WHEREAS, a Mitigation Advisory Committee ("MAC") comprised of representatives from the counties of Franklin, Henry, Patrick and Pittsylvania; the cities of Danville and Martinsville; and the towns of Chatham, Boones Mill, Gretna, Hurt, Ridgeway, Rocky Mount and Stuart was convened in order to study the West Piedmont Region's risks from and vulnerabilities to natural hazards, and to make recommendations on mitigating the effects of such hazards on the West Piedmont Region; and

WHEREAS, a request for proposals was issued to hire an experienced consulting firm to work with the MAC to develop a comprehensive natural hazard mitigation plan for the West Piedmont Planning District; and

WHEREAS, the efforts of the MAC members and the consulting firm of Dewberry, in consultation with members of the public, private and non-profit sectors, have resulted in the development of a Hazard Mitigation Plan for the West Piedmont Planning District including the City of Martinsville; now, therefore

BE IT RESOLVED by the City Council of the City of Martinsville, Virginia, in regular session assembled April 25, 2006 that the Hazard Mitigation Plan dated March 2006 is hereby approved and adopted for the City of Martinsville.

Attest

Susan N. Johnson, Clerk of Council

April 25, 2006
Date Adopted



COUNTY OF PATRICK

P.O. Box 466 STUART, VIRGINIA 24171 Telephone: (276) 694-6094 Fax: (276) 694-2160

Roger L. Martin, Chairman David G. Young, Vice Chairman H. Danny Foley, Sr., Member Crystal P. Harris, Member Jonathan Large, Member Regena H. Handy, Administrator

VIRGINIA: At a regular meeting of the Board of Supervisors of the County of

Patrick, held at the Patrick County Veterans' Memorial Building

thereof on Monday, May 8, 2006 at 2:00 p.m.

PRESENT: Roger L. Martin, Chairman; David G. Young, Vice Chairman;

H. Danny Foley, Sr., Crystal P. Harris, and Jonathan Large, Board Members; Regena H. Handy, County Administrator; Michael Burnette, Assistant County Administrator; Eric Helms Monday, County Attorney; and Mary Beth Roberson, Assistant to the County

Administrator.

On motion made and duly seconded:

WHEREAS, the Disaster Mitigation Act of 2000, as amended, requires that local governments develop and adopt natural hazard mitigation plans in order to receive certain federal assistance; and

WHEREAS, a Mitigation Advisory Committee ("MAC") comprised of representatives from the Counties of Franklin, Henry, Patrick and Pittsylvania; the Cities of Danville and Martinsville; and the Towns of Chatham, Boones Mill, Gretna, Hurt, Ridgeway, Rocky Mount and Stuart was convened in order to study the West Piedmont Region's risks from vulnerabilities to natural hazards, and to make recommendations on mitigating the effects of such hazards on the West Piedmont Region; and

WHEREAS, a request for proposals was issued to hire an experienced consulting firm to work with the MAC to develop a comprehensive natural hazard mitigation plan for the West Piedmont Planning District; and

WHEREAS, the efforts of the MAC members and the consulting firm of Dewberry, in consultation with members of the public, private and non-profit sectors, have resulted in the development of a Hazard Mitigation Plan for the West Piedmont Planning District including Patrick County.

NOW, THEREFORE, BE IT RESOLVED by the Patrick County Board of Supervisors that the Hazard Mitigation Plan dated March 2006 is hereby approved and adopted for the County of Patrick. A copy of the plan is attached to this resolution.

Motion carried.

Voting Aye: Martin, Young, Foley, Harris, and Large

Voting Nay: None

A COPY,

TESTE:

Regena H. Handy, County Administrator

PITTSYLVANIA COUNTY BOARD OF SUPERVISORS RESOLUTION 2006-05-35

RESOLUTION ADOPTING A NATURAL HAZARDS MITIGATION PLAN FOR WEST PIEDMONT PLANNING DISTRICT COMMUNITIES:

WHEREAS, the Disaster Mitigation Act of 2000, as amended, requires that local governments develop and adopt natural hazard mitigation plans in order to receive certain federal assistance; and

WHEREAS, a Mitigation Advisory Committee ("MAC") comprised of representatives from the counties of Franklin, Henry, Patrick and Pittsylvania; the cities of Danville and Martinsville; and the towns of Chatham, Boones Mill, Gretna, Hurt, Ridgeway, Rocky Mount and Stuart was convened in order to study the West Piedmont Region's risks from and vulnerabilities to natural hazards, and to make recommendations on mitigating the effects of such hazards on the West Piedmont Region; and

WHEREAS, a request for proposals was issued to hire an experienced consulting firm to work with the MAC to develop a comprehensive natural hazard mitigation plan for the West Piedmont Planning District; and

WHEREAS, the efforts of the MAC members and the consulting firm of Dewberry, in consultation with members of the public, private and non-profit sectors, have resulted in the development of a Hazard Mitigation Plan for the West Piedmont Planning District including Pittsylvania County.

NOW THEREFORE, BE IT RESOLVED by the Pittsylvania County Board of Supervisor's that the Hazard Mitigation Plan dated March 2006 is hereby approved and adopted for the County of Pittsylvania. A copy of the plan is attached to this resolution.

Given under my hand this 1st day of May 2006.

M. Kate Berger, Madam Chairwoman Pittsylvania County Board of Supervisors

William D. Sleeper, Clerk

Pittsylvania County Board of Supervisors

RESOLUTION ADOPTING A NATURAL HAZARDS MITIGATION PLAN FOR WEST PIEDMONT PLANNING DISTRICT COMMUNITIES:

WHEREAS, the Disaster Mitigation Act of 2000, as amended, requires that local governments develop and adopt natural hazard mitigation plans in order to receive certain federal assistance, and

WHEREAS, a Mitigation Advisory Committee ("MAC") comprised of representatives from the counties of Franklin, Henry, Patrick and Pittsylvania; the cities of Danville and Martinsville; and the towns of Chatham, Boones Mill, Gretna, Hurt, Ridgeway, Rocky Mount and Stuart was convened in order to study the West Piedmont Region's risks from and vulnerabilities to natural hazards, and to make recommendations on mitigating the effects of such hazards on the West Piedmont Region; and

WHEREAS, a request for proposals was issued to hire an experienced consulting firm to work with the MAC to develop a comprehensive natural hazard mitigation plan for the West Piedmont Planning District; and

WHEREAS, the efforts of the MAC members and the consulting firm of Dewberry, in consultation with members of the public, private and non-profit sectors, have resulted in the development of a Hazard Mitigation Plan for the West Piedmont Planning District including the Town of Ridgeway.

NOW THEREFORE, BE IT RESOLVED by the Ridgeway Town Council that the Hazard Mitigation Plan dated March 2006 is hereby approved and adopted for the Town of Ridgeway. A copy of the plan is attached to this resolution.

ADOPTED by the Town this 4th day of April, 2006.

APPROVED:

Mayor, Town of Ridgeway Vi

ATTEST:

Ridgeway Town Clerk



A RESOLUTION OF APPROVAL AND ACCEPTANCE OF NATURAL HAZARDS MITIGATION PLAN FOR WEST PIEDMONT PLANNING DISTRICT COMMUNITIES BY THE TOWN COUNCIL OF ROCKY MOUNT, VIRGINIA

WHEREAS, the Disaster Mitigation Act of 2000, as amended, requires that local governments develop and adopt natural hazard mitigation plans in order to receive certain federal assistance, and

WHEREAS, a Mitigation Advisory Committee ("MAC") comprised of representatives from the counties of Franklin, Henry, Patrick and Pittsylvania; the cities of Danville and Martinsville; and the towns of Chatham, Boones Mill, Gretna, Hurt, Ridgeway, Rocky Mount and Stuart was convened in order to study the West Piedmont Region's risks from and vulnerabilities to natural hazards, and to make recommendations on mitigating the effects of such hazards on the West Piedmont Region; and

WHEREAS, a request for proposals was issued to hire an experienced consulting firm to work with the MAC to develop a comprehensive natural hazard mitigation plan for the West Piedmont Planning District; and

WHEREAS, the efforts of the MAC members and the consulting firm of Dewberry, in consultation with members of the public, private and non-profit sectors, have resulted in the development of a Hazard Mitigation Plan for the West Piedmont Planning District including the Town of Rocky Mount, Virginia.

NOW THEREFORE, BE IT RESOLVED by the Rocky Mount Town Council that the Hazard Mitigation Plan dated March 2006 is hereby approved and adopted for the Town of Rocky Mount. A copy of the plan is attached to this resolution.

ADOPTED by the Town of Rocky Mount this 10th day of April 2006.

APPROVED:

Mark H. Newbill, Mayor

ATTEST:

Patricia H. Keatts, Town Clerk



100 Patrick Avenue
P.O. Box 422
Stuart, Virginia 24171
Phone: (276) 694-3811
Fax: (276) 694-2583

James C. McHone Mayor

> Ray Weiland Vice Mayor

Council Members Glen W. (Bill) Gunter Richard Puckett Jason Turner Dale Firebaugh

> T. Terry Tilley Town Manager

Susan C. Slate Clerk/Treasurer

M.C. (Pete) Slate, Jr. Supt. Water & Wastewater

Christopher A. Corbett Town Attorney WHEREAS, the Disaster Mitigation Act of 2000, as amended, requires that local governments develop and adopt natural hazard mitigation plans in order to receive certain federal assistance, and

WHEREAS, a Mitigation Advisory Committee ("MAC") comprised of representatives from the counties of Franklin, Henry, Patrick and Pittsylvania; the cities of Danville and Martinsville; and the towns of Chatham, Boones Mill, Gretna, Hurt, Ridgeway, Rocky Mount and Stuart was convened in order to study the West Piedmont Region's risks from and vulnerabilities to natural hazards, and to make recommendations on mitigating the effects of such hazards on the West Piedmont Region; and

WHEREAS, a request for proposals was issued to hire an experienced consulting firm to work with the MAC to develop a comprehensive natural hazard mitigation plan for the West Piedmont Planning District; and

WHEREAS, the efforts of the MAC members and the consulting firm of Dewberry, in consultation with members of the public, private and non-profit sectors, have resulted in the development of a Hazard Mitigation Plan for the West Piedmont Planning District including the Town of Stuart.

NOW THEREFORE, BETT RESOLVED by Councilman Richard Puckett, seconded by Councilman Bill Gunter and unanimously carried, that the Hazard Mitigation Plan dated March 2006 is hereby approved and adopted for the Town of Stuart. A copy of the plan is attached to this resolution.

ADOPTED by the Town of Stuart on this 17th day of May. 2006.

APPROVED:

James C. M= Hose

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Section I. Executive Summary

Background

Beginning in 2003, the Commonwealth of Virginia encouraged the twenty-one planning districts in the commonwealth to take the lead on development of local hazard mitigation plans. These plans, which are required by the Disaster Mitigation Act of 2000 (DMA2K), help local governments determine risks and vulnerabilities and identify projects to reduce these risks. The plan developed under the auspices of the West Piedmont Planning District Commission will include the counties of Franklin, Henry, Patrick and Pittsylvania; the cities of Danville and Martinsville; and the towns of Chatham, Boones Mill, Gretna, Hurt, Ridgeway, Rocky Mount and Stuart.

The planning district convened a Mitigation Advisory Committee (MAC) comprised of representatives of the participating jurisdictions. The MAC worked with the Dewberry team and provided input at key stages of the process. In addition, the plan was discussed at various public meetings, including a listening session to which over 60 organizations were invited to attend in addition to the general public.

Hazard Identification and Risk Assessment

The Hazard Identification and Risk Assessment consists of three parts:

- 1. Identify what hazards that could affect the West Piedmont Planning District Commission
- 2. Profile hazard events and determine what areas and community assets are the most vulnerable to damage from these hazards
- 3. Estimate losses and prioritize the potential risks to the community

Hazards were ranked by the steering committee to determine what hazards they feel have the largest impact on their communities. Certain hazards were not addressed due to the infrequency of occurrence and/or limited impact. Table I-1 summarizes the results of the hazard identification, which is explained fully in Section V of this plan.

Table I-1. West Piedmont Region Planning Consideration Levels		
Hazard Type	Planning Consideration Level	
Natural		
Winter Storms	Significant	
Flooding	Moderate	
Wind	Moderate	
Drought	Limited	
Hurricane	Limited	
Tornado	Limited	

Table I-1. West Piedmont Region Planning Consideration Levels		
Hazard Type	Planning Consideration Level	
Wildfire	Limited	
Earthquake	None	
Landslide/ Shoreline Erosion	None	
Human-Caused		
Dams	Significant	
HVT Lines	Moderate	
Organic/Inorganic Spills	Moderate	
Pipelines	Moderate	
Agriterrorism	Limited	

The Hazard Identification and Risk Assessment described each of the hazards in varying levels of detail consistent with each planning consideration level. The Hazard Identification and Risk Assessment shows that ice storms generally have greater impact than snow storms. According to the flood analysis, Pittsylvania County has the highest potential flood losses. Wind damages are more likely to result from tornadoes or thunderstorm winds then from hurricanes though the extent of damages due to hurricanes likely would be more widespread. In addition, rural areas are impacted more by drought and wildfire than urban areas.

There are eleven high hazard dams in the West Piedmont region. These dams are classified high hazard because of the impact they could create if they were breached. Henry County has the highest number of these types of dams.

Capability Assessment

The Capability Assessment evaluates the current capacity of the communities of the West Piedmont Planning District to mitigate the effects of the natural hazards identified in the Hazard Identification and Risk Assessment. By providing a summary of each jurisdiction's existing capabilities, the Capability Assessment serves as the foundation for designing an effective hazard mitigation strategy. Table I-2 summarizes the Capability Self-Assessment provided by the participating jurisdictions.

Table I-2. Capability Self-Assessment					
	Planning	Administra			
Jurisdiction	and	tive and	Fiscal	Political	Overall
Jurisaiction	Regulatory	Technical	Capability	Capability	Capability
	Capability	Capability			
City of Danville	M	M	M	M	M
Franklin County	M	L	L	M	M
Henry County	L	L	L	L	L
City of Martinsville	L	L	L	M	L
Patrick County	L	M	L	M	M
Pittsylvania County	M	M	M	M	M

Mitigation Strategy

The West Piedmont committee members used the results of the Hazard Identification and Risk Assessment as well as the Capability Assessment to develop goals and actions for the region and their jurisdictions. The committee members developed the following seven goals:

- 1. To protect persons and property, and reduce future damage and losses to the community
- 2. Implement activities that assist in protecting lives by making homes, businesses, infrastructure, critical facilities, and other property more resistant to natural hazards
- 3. Protect new and existing public and private infrastructure and facilities from the effects of hazards
- 4. Ensure continued functionality of critical services
- 5. Enhance the capabilities and capacity of local government to lessen the impacts of future disasters
- 6. Develop and implement education and outreach programs to increase public awareness of the risks associated with natural hazards
- 7. Promote hazard mitigation as a public value in recognition of its importance to the health, safety, and welfare of the population

In addition, the committee identified and prioritized actions for the region and individual jurisdictions. The priorities differ somewhat from jurisdiction to jurisdiction. Each jurisdiction's priorities were developed based on past damages, existing exposure to risk, community goals, and weaknesses identified in the Capability Assessment.

Plan Maintenance Procedures

The plan outlines a procedure for implementing, maintaining, and updating the plan. The county administrator, city manager, or town manager will be responsible for appointing one or more representatives (e.g., emergency coordinator, planning director) to a group convened by the West Piedmont Planning District Commission. It is expected that the group convened by the Planning District Commission will function as an adjunct to the Regional Emergency Managers Group that already meets on a regular basis. This working group will be responsible for monitoring and updating the plan. The working group also will be responsible for setting measures of success.

A 5-year written update to be submitted to the state and FEMA Region III, unless disaster or other circumstances (e.g., changing regulations) lead to a different time frame. Efforts will be made to inform the public of the implementation and updating of the mitigation plan throughout the next five years.

Conclusion

This plan symbolizes the continued commitment and dedication of the West Piedmont region's local governments and community members to enhancing the safety of residents and businesses by taking actions before a disaster strikes. While nothing can be done to prevent natural hazard events from occurring, the region is poised to minimize the disruption and devastation that so often accompanies these disasters.

Section II. Introduction

Mitigation

Mitigation is commonly defined as sustained actions taken to reduce or eliminate long-term risk to people and property from hazards and their effects. Hazard mitigation focuses attention and resources on community policies and actions that will produce successive benefits over time. A mitigation plan states the aspirations and specific courses of action that a community intends to follow to reduce vulnerability and exposure to future hazard events. These plans are formulated through a systematic process centered on the participation of citizens, businesses, public officials, and other community stakeholders.

A local mitigation plan is the physical representation of a jurisdiction's commitment to reduce risks from natural hazards. Local officials can refer to the plan in their day-to-day activities and in decisions regarding regulations and ordinances, granting permits, and in funding capital improvements and other community initiatives. Additionally, these local plans will serve as the basis for states to prioritize future grant funding as it becomes available.

It is hoped that the West Piedmont Hazard Mitigation Plan will be a useful tool for all community stakeholders by increasing public awareness about local hazards and risks, while at the same time providing information about options and resources available to reduce those risks. Teaching the public about potential hazards will help each of the area's jurisdictions protect themselves against the effects of the hazards, and will enable informed decision making on where to live, purchase property, or locate businesses.

The area covered by this plan includes the counties of Franklin, Henry, Patrick and Pittsylvania; the cities of Danville and Martinsville; and the towns of Chatham, Boones Mill, Gretna, Hurt, Ridgeway, Rocky Mount and Stuart.

The Local Mitigation Planning Impetus

On October 30, 2000, President Clinton signed into law the Disaster Mitigation Act of 2000 (DMA 2000), which established a national disaster hazard mitigation grant program that would help to reduce loss of life and property, human suffering, economic disruption, and disaster assistance costs resulting from natural disasters.

DMA 2000 amended the Robert T. Stafford Disaster Relief and Emergency Assistance Act and added a new section to the law, Section 322 Mitigation Planning. Section 322 requires local governments to prepare and adopt jurisdiction-wide hazard mitigation plans for disasters declared after November 1, 2003, (subsequently revised to

November 1, 2004) as a condition of receiving Hazard Mitigation Grant Program (HMGP) project grants and other forms of non-emergency disaster assistance. Local governments must review and, if necessary, update the mitigation plan every five years from the original date of the plan to continue program eligibility.

Interim Final Rule Planning Criteria

As part of the process of implementing DMA 2000, FEMA prepared an Interim Final Rule to define the mitigation planning criteria for States and communities. Published in the *Federal Register* on February 26, 2002, at 44 CFR Part 201, the Rule serves as the governing document for DMA 2000 planning implementation.

Organization of the Plan

The remaining sections of this document follow the process enumerated in DMA 2000.

Section III – Planning Process describes the West Piedmont region's stakeholder involvement and defines the processes followed throughout the creation of this plan.

Section IV – Community Profile provides a physical and demographic profile of the area, looking at things such as geography, hydrography, development, people, and land uses.

Section V – Hazard Identification and Risk assessment evaluates the natural hazards likely to affect the West Piedmont region, and quantifies whom, what, where, and how the region might be affected by natural hazards.

Section VI – Capability Assessment analyzes each of the four local jurisdictions' policies, programs, plans, resources, and capabilities to reduce exposure to hazards in the community.

Section VI – Mitigation Strategy addresses the West Piedmont region's issues and concerns for hazards by establishing a framework for mitigation activities and policies. The strategy includes a mission, statement, goals, objectives, and a range of actions to achieve the goals.

Section VIII – Plan Maintenance Procedures specifies how the plan will be monitored, evaluated, and updated, including a process for continuing stakeholder involvement once the plan is completed.

Section IX – References include a list of reports and data used to develop this plan.

Section X – Appendices are included at the end of the plan, and contain supplemental reference materials and more detailed calculations and methodologies used in the planning process. The appendices also provide a list of commonly used mitigation terms and acronyms.

Section III. Planning Process

The West Piedmont Planning District Commission has seven member localities – Franklin, Henry, Patrick, and Pittsylvania Counties; the Cities of Danville and Martinsville; and the Town of Rocky Mount. The Planning District Commission was formed by these local governments in 1968 under the authority of the Virginia Area Development Act. The Planning District Commission serves to build regional approaches to issues like economic development, transportation, and legislative priorities.

Beginning in 2003, the State of Virginia encouraged the twenty-one planning districts in the state to take the lead on development of local hazard mitigation plans. These plans, which are required by DMA 2000, help local governments determine risks and vulnerabilities and identify projects to reduce these risks. The plan developed under the auspices of the West Piedmont Planning District Commission will include the counties of Franklin, Henry, Patrick and Pittsylvania; the cities of Danville and Martinsville; and the towns of Chatham, Boones Mill, Gretna, Hurt, Ridgeway, Rocky Mount and Stuart.

After receiving funding in 2004, the West Piedmont Planning District contracted with the engineering consulting firm, Dewberry, to develop a multi-hazard mitigation plan including a Hazard Identification and Risk Assessment (HIRA) and mitigation strategies. The Mitigation Advisory Committee worked with the consultants throughout the planning process to ensure that potential stakeholders participated in the planning process and had opportunities for input in the draft and final phases of the plan.

The Mitigation Advisory Committee

The planning district convened a Mitigation Advisory Committee (MAC) comprised of representatives of the participating jurisdictions. The MAC worked with the Dewberry team and provided input at key stages of the process. Efforts to involve city and county departments and community organizations that might have a role in the implementation of the mitigation actions or policies included invitations to attend MAC. meetings and serve on the access the project website to (projects.dewberry.com/wpiedHMP), e-mails updates, strategy development workshops, plus opportunities for input and comment on all draft deliverables.

The West Piedmont Planning District Commission would like to thank and acknowledge the following persons who served on the MAC and their representative departments and organizations throughout the planning process:

Table III-1. West Piedmont Mitigation Meeting Participants			
Name	Title and/or Department	Jurisdiction	
Aaron Burdick	Planning and Zoning Administrator	Town of Rocky Mount	
Jim Davis	Director of Emergency Management and Communications	Pittsylvania County	
Frank Fiori	Planning	Franklin County	
Lynn Frith	Town Manager	Town of Boones Mill	
Regena Handy	County Administrator	Patrick County	
Robert Hanson	Director of Public Works	Town of Chatham	
Mike Hill	Town Manager (acting)	Town of Hurt	
Mike Hudson	Emergency Management Coordinator	Patrick County	
Ken Gillie, Jr.	Planning Division Director	City of Danville	
Bonnie Johnson	Assistant County Administrator	Franklin County	
David Lilly	Town Manager	Town of Gretna	
Wayne D.P. Knox	Director/Community Development	City of Martinsville	
Ed Page	Mayor	Town of Ridgeway	
Bob Phillips	Emergency Management Coordinator	City of Martinsville	
Greg Sides	Pittsylvania County Planner	Pittsylvania County	
Chris Slemp	Director of Public Safety	Franklin County	
Terry Tilley	Town Manager	Town of Stuart	
Leon Towarnicki	Director/Public Works	City of Martinsville	
Dale Wagoner	Deputy Director/Public Safety	Henry County	
Doug Young	Emergency Management Coordinator	City of Danville	
West Piedmont Planning District Commission Staff			
Robert W. Dowd	Executive Director	West Piedmont PDC	
Joan Hullett	Regional Planner	West Piedmont PDC	

Between December 2004 and September 2005, the MAC held four meetings and supervised work on the area's mitigation plan. The MAC members coordinated and consulted with other entities and stakeholders to identify and delineate natural hazards within the seven local jurisdictions and to assess the risks and vulnerability of

public and private buildings, facilities, utilities, communications, transportation systems, and other vulnerable infrastructure.

In developing the mitigation plan, a majority of necessary communication occurred through telephone calls and emails. The MAC and its consultant chose this avenue to best accommodate budgets and schedules. A project website (http://projects.dewberry.com/wpiedHMP/MAC) was established to facilitate the planning process. Table III-2 documents formal meeting dates and their purposes.

Table III-2. Mitigation Advisory Committee			
Meeting Dates	Summary of Discussions		
December 16, 2004	Planning process was described. Commitment to the project and schedule was obtained. Discussion regarding the purpose of the plan was held. Hazard identification and prioritization exercise was conducted. Preliminary hazard history and problem spot information was collected. Preliminary goals were discussed		
April 5, 2005	Results of the HIRA were presented. Region-wide goals for the plan were discussed and debated. Mitigation alternatives were presented. A public meeting followed the committee meeting.		
May 26, 2005	Draft Plan presentation. Regional and local action plans were discussed. Plan maintenance procedures were agreed upon.		
January 25, 2005	Tentative meeting date – final plan presentation. Adoption process to be discussed.		

Public Participation and Citizen Input

As shown in Table III-2 above, the public was afforded several opportunities to provide input and to participate throughout the planning process. An open public meeting was held on April 6, 2005, to allow the general public an opportunity to meet with the planning consultants and MAC members, ask questions, and provide comments and input on the draft mitigation plan. Representatives from various agencies and organizations were invited to attend the public meeting. Table III-3 lists these agencies and organizations.

Table III-3. Interested Parties		
Organization	Organization	
American Red Cross	Averett University	
Carilion Franklin Memorial Hospital	Chatham Police Chief	
Chief of Police, City of Danville	Chief of Police, City of Martinsville	
Chief of Police, Town of Rocky Mount	Danville City Schools	
Danville Community College	Danville Community Improvement Council	

Table III-3. Interested Parties			
Danville Department of Social Services	Danville Fire Department		
Danville Housing & Redevelopment Authority	Danville Office of Economic Development		
Danville Power & Light	Danville Regional Medical Center		
Danville Water & Gas Distribution	Danville-Pittsylvania County Chamber of Commerce		
Danville-Pittsylvania Health Department	Ferrum College		
Ferrum Water & Sewerage Authority	Franklin County Chamber of Commerce		
Franklin County Dept of Social Services	Franklin County Public Schools		
Franklin County Sheriff's Department	Franklin-Patrick/Martinsville-Henry		
Frankin County Sherin 8 Department	Health Department		
Gretna Police Chief	Habitat for Humanity		
Henry County Sheriff's Department	Henry County Public Schools		
Henry County Public Service Authority	Henry-Martinsville Department of Social Services		
Hurt Police Chief	Martinsville City Schools		
Martinsville Electric Department	Martinsville Fire Department		
Martinsville Housing Services Office	Martinsville Water-Wastewater Director		
Martinsville-Henry County Chamber of Commerce	Martinsville-Henry County		
Watthisvine-Henry County Chamber of Commerce	Economic Development Corporation		
Memorial Hospital of Martinsville-Henry County	NAACP - Danville		
NAACP – Pittsylvania County	Patrick County Chamber of Commerce		
Patrick County Department of Social Services	Patrick County Office of Economic Development		
Patrick County Public Schools	Patrick County Sheriff's Department		
Patrick Henry Community College	Pittsylvania County Community Action		
Pittsylvania County Sheriff's Department	Pittsylvania Dept of Social Services		
Pittsylvania Economic Development Organization	Pittsylvania Public Service Authority		
R.J. Reynolds Patrick County Memorial Hospital	Smith Mountain Lake Association		
Southside Community Action Agency	Support to Eliminate Poverty		
Telamon Corporation Incorporated Housing Services	The Salvation Army		
USDA – Natural Resources Conservation Service			

The hazard mitigation plan also was discussed at several West Piedmont Planning District Commission meetings, which are advertised and open to the public. A customizable brochure was developed for the jurisdictions to use in their public outreach efforts. This brochure was widely distributed throughout the planning district.

The draft plan was made available on a public website created for the project (http://projects.dewberry.com/WPiedHMP), which also was accessible from the Planning District Commission's website (http://www.wppdc.org). Hard copies were made available for review at the offices of each participating jurisdiction. An ad was run in newspapers throughout the planning area to inform the public that the draft plan was available for review.

Neighboring jurisdictions were invited to review and provide input into the plan. These jurisdictions included:

Virginia:

- Mount Rogers PDC
- New River Valley PDC
- Region 2000 Regional Commission
- Roanoke Valley-Alleghany Regional Commission
- Southside PDC

North Carolina:

- Caswell County
- Rockingham County
- Stokes County
- Surry County

Participating jurisdictions were encouraged to obtain formal acknowledgement of the MAC from their governing boards, and to appoint MAC members by resolution. A sample resolution for establishing the Mitigation Advisory Committee is included in Appendix A.

Section IV. Community Profile

Introduction

The West Piedmont Planning District Commission (WPPDC) is located in the historic and scenic mountains and foothills of southwestern Virginia. The District is comprised of four counties and two independent cities. The region also has seven incorporated towns within its borders. The jurisdictions included in this plan are:

- ❖ Franklin County
- Henry County
- Patrick County
- Pittsylvania County
- City of Danville
- City of Martinsville

- Town of Boones Mill
- Town of Chatham
- Town of Gretna
- ❖ Town of Hurt
- Town of Rocky Mount
- ❖ Town of Stuart



Figure IV-1. Location of the West Piedmont District

The planning area encompasses approximately 2,582.7 square miles and is home to some 250, 195 persons. The West Piedmont Planning District is bounded on the west by the elevations of the Blue Ridge Mountains and on the east by the foothills of the Piedmont. The State of North Carolina forms the southern border of the study area.

The Roanoke (Staunton) River forms the northeast border of the Planning District flowing in a southeastern direction towards the Atlantic Ocean. Portions of the Roanoke River Basin, in which the Planning District lies, are developing into major commercial and industrial concentrations. Recreational development and associated business development within the region also have expanded due to the presence of Smith Mountain and Leesville Lakes, Philpott Lake, Fairy Stone State Park, and the Blue Ridge Parkway.

Of the District's 1.6 million acres of land, approximately 10,712 acres are publicly held and protected by three Wildlife Management Areas and one Natural Area Preserve. The headwaters of the Banister, Blackwater, Dan, Mayo, Pigg and Smith rivers are located in the District. Divided by U.S. Highways 58, 220, 29 and 360, the District is located just south of Roanoke, approximately 50 miles north of Greensboro, NC, 140 miles southwest of Richmond, VA and 200 miles west of the Port of Hampton Roads.

Based on total land mass, Henry County is the smallest county in the planning area with 382 square miles. Pittsylvania County is the largest at 971 square miles. Patrick County contains 483 square miles, while Franklin County encompasses 692 square miles. The City of Danville is 43 square miles and the City of Martinsville covers 11 square miles.

Physiography

The District falls within two subprovinces of the Piedmont of Virginia (see Figure IV-2 for a map of the physiographic provinces and subprovinces. The Foothills Subprovince (F) is characterized by broad rolling hills and moderate slopes. This area subprovince covers the western portion of the District, just east of the Blue Ridge Mountains. Elevations range from 400 to 1,000 feet, with peaks rising to 1,500 to 2,500 feet. The other subprovince, covering the majority of the District, is the Outer Piedmont Subprovince (OP). This subprovince is characterized by broad upland with low to moderate slopes. Elevations range from 600 to 1,000 feet in the west, gradually diminishing to 250 to 300 in the east.¹

¹ Bailey, C. M. *Physiographic Map of Virginia*. 1999. Retrieved from http://www.wm.edu/geology/virginia/phys-regions.html#piedmont

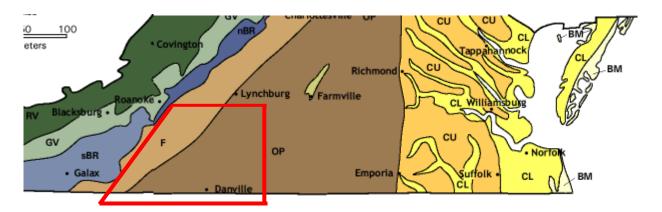


Figure IV-2. Physiographic Provinces of West Piedmont District

Hydrology

The planning area lies within two major watersheds – the Roanoke, and the Yadkin, with 95% of the area in the Roanoke. The Roanoke watershed spans 6,274 square miles, the second largest in Virginia, and is fed mainly by the Roanoke River, the Dan River, the Banister River and the Kerr Reservoir. The Yadkin watershed is fed by the Ararat River and covers about 118 square miles.

The planning area is bound on the north by the Roanoke River and the south by the Dan River, the Sandy River and the North and South Mayo Rivers. In addition, the Pigg River flows through it and numerous creeks crisscross the planning area.

Land Use and Development Trends

The counties in the planning area are primarily rural while the cities exhibit a more urban/suburban development pattern. There are also seven incorporated towns in the planning area that act as commercial and residential nodes.

City of Danville

The City of Danville is the primary economic center within Pittsylvania County. The City currently lacks direct access to a federal interstate highway, which has hindered its growth. The City of Danville has developed industrial parks in recent years. Airside Industrial Park is located just off U.S. Route 58 in the vicinity of the Danville Regional Airport. River View Industrial Park, which is adjacent to Airside Industrial Park, has been expanded in conjunction with the development of the Cyberpark, located near the intersection of U.S. Route 58 and 29. The City, in cooperation with Pittsylvania County, has recently completed development of a regional industrial

park—the Cane Creek Centre is located off U.S. Route 58 in the Ringgold area of Pittsylvania County. Danville is home to several manufacturing companies including Dan River Inc, Goodyear Tire & Rubber Co., Nestle Refrigerated Foods, and Corning Glassworks. Danville has a variety of housing options ranging from early 20th-century Victorians, Georgian Revival and Edwardian architecture to suburban Colonial-style homes to neighborhoods centered on golf courses. According to the City's Comprehensive Plan, the city's policy of underwriting infrastructure costs for residential subdivisions has encouraged "leapfrog" development.

The City of Danville's Future Land Use Plan emphasizes conserving vulnerable environmental areas while also providing areas for projected development. The plan organizes the city by twelve planning areas and ten entrance corridors. Areas such as large contiguous tracts of sensitive slope, floodplains and wetlands are excluded from the developable parts of each planning areas. Approximately 9,494 acres are available for development according to the Comprehensive Plan. The plan estimates that between 9,000 and 15,000 homes could be built in the City, given the amount of developable land that is available. Almost two million square feet of retail and services uses could be accommodated while the Future Land Use Plan allows for between 20-25 million square feet of employment generating development. Overall, About 58% of the land would be used for residential, 5% for office or services uses, and about 35% for economic development or industrial uses. The remaining two percent are classified as government, public, or other uses.

Franklin County

As of 1995, almost 40% of the land in Franklin County was used for agriculture. This percentage is likely to have decreased in accordance with the general decline in the number of acres used for farming that was seen between 1964 and 1987. Tobacco was the leading cash crop in the area, however, is likely not to be true in the future given the national downward trend in tobacco crops. In addition, dairy, eggs, apples and timber contributed to the farming sector's earnings. According to the 2002 Census of Agriculture, Franklin County ranked third out of 83 milk-producing counties in Virginia. Agriculture is concentrated in the eastern and central portions of the County. According to the 1995 Comprehensive Plan, about 64% of the County was forested (a portion of which was also classified as agriculture). Much of this land is in the northwest, western and southeastern parts of the County along the mountain slopes.

The Comprehensive Plan describes four general patterns of residential development: rural residential, low-density residential in rural areas, low-density residential

focused around Smith Mountain Lake, and medium-density residential associated with towns, Smith Mountain Lake planned communities, and community centers. The first type, rural residential, is characterized by lots of ½ acre to five acres served by private roads and is evenly dispersed throughout the County. The other residential found in rural areas are also typically lots of ½ acre to five acres and front state-maintained roads. Multi-family dwellings are also included in this classification. The third type of development, low-density residential focused around Smith Mountain Lake, is characterized by one acre or smaller lots on the water. Increasingly, these are single-family homes instead of mobile home parks, campgrounds or other more modest accommodations. Medium-density residential typically has access to public water and sewer. It is typically closer to jobs, public services and retail shopping. Most of this type of development is found in Rocky Mount, Boones Mill, and Ferrum.

Most of the commercial centers are near the major towns or community centers. Major transportation nodes also tend to be the location of smaller commercial concentrations. Clusters of stores and services also occur in smaller communities such as Callaway, Glade Hill, Snow Creek and Fork Mountain. Strip commercial highway development also is evident along Route 220 North and Route 40.

Manufacturing accounts for a major segment of the Franklin County's industrial base. Most of the plants are located in or near Rocky Mount. About 32% of the County's workers were employed in the manufacturing sector (as of 2000 (only 23% in 2003)). The types of manufacturing occurring in the County include wood products, textiles and modular and mobile homes. The Franklin County-Rocky Mount Industrial Park is located north of Route 40 East inside the Rocky Mount Town Limits. The Rocky Mount Technology Park is located in the northern part of Rocky Mount in close proximity to U.S. Route 220. The Commerce Center is being developed approximately five miles south of Rocky Mount in the County just off U.S. Route 220. The Ferrum Business Park has property available for development in the Ferrum College vicinity of the County located off Route 40.

The 100-year floodplain, as identified in the FEMA Flood Insurance Rate Maps, covers portions of land along the Roanoke, Pigg, and Blackwater Rivers as well as along the Chestnut, Maggodee, Gills, and Stony Creeks. These areas are regulated and are part of the County's permanent open space system.

The County Comprehensive Plan describes a desired Future Land Use pattern. Incorporated towns or unincorporated Community Centers are meant to be the focus

of commercial services and social activity. These services are intended to serve people within a 5-10 mile radius. Surrounding the towns and community centers are rural, low- and medium-density residential development. Designated areas include Rocky Mount, Boones Mill, Ferrum and Smith Mountain Lake. Rural Village Centers are the second of the desired development types. These areas are to be the focus of rural commercial services, social activities and community life. Schools, fire stations, churches, and post offices would be at the center surrounded by rural residential. Other recognized development patterns or locations include Commercial Highway Corridors and Interstate Highway Interchanges. Land use policies are also described for farmlands, forestlands, and residential.

Henry County

Henry County was established in the late 1700s. The County is home to numerous historic resources including the Martinsville Fish Dam. According to the Comprehensive Plan, the County has changed considerably since its founding. Industrial expansion, in the sectors of wood furniture and pre-manufactured homes, brought concurrent residential and commercial development. The early settlement pattern was typical of early industrial America, where factory workers lived close to their place of employment. These factories often were located near rivers which served as power sources, a pattern seen in Henry County where much of the early industry was located near the Smith River. As automobiles and trucks became more common, development tended to occur along the major traffic routes and became more dispersed resulting in the now familiar sprawl development. Overall, the development in the County can be categorized as either strip development (commercial and residential) or sprawl development (e.g., large lot subdivisions). The Comprehensive Plan recognizes that the dispersed development pattern increases the cost of public service provision.

There are three industrial parks in Henry County—the Bowles Center, located adjacent to Patrick Henry Community College off Route 174; the Patriot Centre at Beaver Creek, just outside the Martinsville City Limits off Route 174; and the Martinsville Industrial Park east of U.S. Route 220 and south of Martinsville.

The County has seen a general trend towards an aging population, as younger people leave the area and other older people retire to the County. Single-family homes account for the majority of the housing stock, though manufactured homes account for 20% of the overall housing stock. Double-wide manufactured homes, in particular, are becoming increasingly popular.

The Comprehensive Plan, when looking at future development patterns, classifies land in the County into two categories - growth and rural areas. Growth areas are characterized generally as having (or will have) road networks, public water and sewer, and physical suitability for development (i.e., not a floodplain or steep slope). Growth areas include: Collinsville/Fieldale, Bassett/Stanleytown, Iriswood, Ridgeway, Horsepasture, Laurel Park/Chatmoss and West Bassett. In addition, the plan explicitly calls for floodplains to be utilized for appropriate uses such as agriculture and recreation. The plan calls for a variety of tools to be used in implementation including zoning, subdivision ordinances, density bonuses, planned unit development (PUDs), and conditional zoning.

City of Martinsville

Until the opening of the new Henry County Courthouse in 1996, the City of Martinsville served as the Henry County seat since its founding in 1793. In the late 1800s, the City was home to many tobacco factories that processed the crops grown in the surrounding area. Furniture making began to play a major role in the economy during the early 20th century. Martinsville transitioned from an agriculture-based economy to an industrially-based economy during the first half of the 20th century. This fact is illustrated by DuPont building the world's largest nylon manufacturing plant just outside of Martinsville in 1941.

Martinsville's development pattern, in part, follows the typical "mill town" pattern, where residential development is located adjacent to industrial development. Most of the industrial development is located south and southeast of the Central Business District as well as along the major arteries such as East Commonwealth Boulevard, Liberty Street, Route 58 East and Stultz Road. In 1998, the City developed Clearview Business Park just off Clearview Drive.

Patrick County

Patrick County is mainly rural in nature, though it does have some industrial and commercial development (some of which is related to agriculture). Much of the undeveloped land in the County is forested. Since colonial times, an important part of Patrick County's economy has been agriculture. In the beginning, the main crops were tobacco, cabbage and tomatoes, but farming has moved towards cattle and dairy. More people, however, are employed in the manufacturing sector than in farming.

Residential development is dispersed throughout the County, in conjunction with farms. Some concentration of residences can be found in the Town of Stuart and Patrick Springs Community. In addition, concentrations of commercial development

can be found in Stuart, Woolwine, and Patrick Springs or along various highway routes. Industrial development is located in the southwestern part of the County near Stuart, along Route 58 near Meadows of Dan and Vesta, and near Woolwine. The County also purchased land for an industrial park in 1994 near Stuart. In recent years, Rich Creek Corporate Park has been developed in the Patrick Springs area of the County. The federal and state governments are the largest landowners in the area; their holdings include areas surrounding Philpott Reservoir, the Blue Ridge Parkway, the Rocky Knob Recreation Area, Fairy Stone State Park and the Fairystone Farms Wildlife Management Area. In addition, the City of Danville owns a considerable amount of land associated with the Pinnacles hydroelectric project.

Future land use is expected to follow a slow or moderate, rational growth pattern. Expected growth is likely to occur in the eastern portions of the County, centering on the existing towns and communities including Stuart, Patrick Springs, and Critz. This growth is anticipated to be residential in nature with a limited amount of accompanying commercial development along U.S. Route 58. Overall, agricultural and forested lands are expected to remain the same.

Pittsylvania County

Pittsylvania is the largest county by land area in the state. About 35% of the County is used for farming. Agricultural uses are located in the central, southwestern and southeastern parts of the County. Growth, however, is anticipated in the south-central and north-central parts of the County, which means the agricultural lands should remain unthreatened by development. Commercial forests account for the majority of the County's land use.

Two types of residential patterns exist in the County. Residential uses tend to be either dispersed, low-density development along transportation corridors or clustered in and around commercial centers. Much of the first type of residential development is associated with farms. Commercial development is associated with highways or the existing population centers of Chatham, Gretna, Hurt, and the City of Danville. Industrial uses can be found near Chatham and Danville.

There are a number of industrial parks in Pittsylvania County. As previously mentioned, the County and the City of Danville have recently developed Cane Creek Centre off U.S. Route 58 in the Ringgold vicinity of the County. Other parks include Ringgold East and Ringgold West off Route 730; the Chatham South and Chatham North Industrial Parks off U.S. Route 29 in the vicinity of the Town of Chatham; and the Gretna Industrial Park off U.S. Route 29 just outside the Town of Gretna. There is

industrial property for development at the Key Industrial Park in the Town of Hurt as well. In addition, the County is currently developing the Brosville Business Centre just off U.S. Route 58 approximately five miles east of the Henry County line.

As of 1986, four separate central water systems served about 15% of the County's population with the remainder on wells or private water systems. Also, as of 1986, the County receives an Insurance Rating Organization rating of between 8 and 10 depending on location. This rating affects fire insurance premiums and is based on a number of factors including water supply, fire department, fire communications and fire safety control.

The Comprehensive Plan calls for a Nodal Alternative development pattern to be adopted. This development pattern would concentrate development in the Route 29 corridor and nodes north of the Route 58 corridor east and west of Danville. Development in the County is relatively low density so a great deal of growth could be accommodated. The nodal alternative also recognizes the development constraints caused by floodplains, steep slopes and agricultural land. The Comprehensive Plan recognizes that the Dan and Sandy Rivers and Cherrystone Creek are susceptible to flooding.

Climate

The present-day climate of Virginia is generally classified as humid subtropical, yet few states have a more diverse climate than that of Virginia.² In the planning area, the Blue Ridge Mountains to the west produce blocking and steering effects on storms and air masses from the Great Lakes.

Seasonal temperatures are relatively uniform within the planning area; average temperatures in the planning area are about 76 degrees Fahrenheit in the summer and 38 degrees in the winter.

Annual snowfall totals vary between the jurisdictions from a high of 14.5 inches (Henry County) to a low of 3.3 inches (Pittsylvania County).³ Average annual rainfall is around 43 inches, with a high of 49 inches (Patrick County) and a low of 43 inches (City of Danville).

² The Natural Communities of Virginia – http://www.dcr.virginia.gov/dnh/ncoverview.htm

³ Community Overview. Retrieved from http://www.yesvirginia.org/corporate_location/vamapsouthern.aspx

Population

The total population of the jurisdictions included in this study is 250,195 (as of the 2000 Census). The growth rates between the four counties vary dramatically, ranging from a high of 19.6% (Franklin County) to a low of 1.7% (Henry County). During this same period (1990-2000), the City of Danville (-8.8%) and the City of Martinsville (-4.6%) both recorded negative growth rates. The growth rate for the State of Virginia was 14.4%. The 2003 population estimate shows that all of the jurisdictions except for Franklin County experienced negative growth.

Table IV-1 shows the population breakdown by jurisdiction with the associated growth rate and number of persons per household.

Table IV-1. Population by Jurisdiction ⁴								
	Franklin County	Henry County	Patrick County	Pittsylvania County	City of Danville	City of Martins- ville		
Population, 2003 estimate	49,095	57,090	19,182	61,640	46,988	15,121		
Population, percent change, April 1, 2000 to July 1, 2003	3.80%	-1.50%	-1.20%	-0.20%	-2.90%	-1.90%		
Population, 2000	47,286	57,930	19,407	61,745	48,411	15,416		
Population, percent change, 1990 to 2000	19.6%	1.7%	11.1%	10.9%	-8.8	-4.6		
Persons per household, 2000	2.44	2.4	2.36	2.49	2.27	2.27		

According to the 2000 Census, females comprise 51.0% of the population in the Virginia. The female population in the planning area ranges from a high of 54.8% in the City of Martinsville to a low of 50.7% in Franklin County.

⁴ U.S. Census Bureau. 2000 U.S. Census. Retrieved from http://www.census.gov

The majority of the population in the planning area, according to the Census, is White (74.2%). African-Americans make up 24.9% of the population. Two percent of the population is of Hispanic origin. Very few residents (1.7%) in the planning area were foreign-born and less than 4% of the population reported that they spoke a language other than English at home.

One type of special needs group is characterized by age. Only 5.7% (14,182) of the population is under the age of five while 22.6% (56,621) is under the age of 18. The percentage of people over the age of 65 is 16.1%, which is forty percent more than that of the state average (11.2%). Special consideration for the needs of the younger and older generations should be given when developing mitigation strategies.

Significantly fewer people in the planning area graduate from high school when compared to the state as a whole (81.5%); about 68% of residents are high school graduates. About eleven percent (11.6%) have obtained bachelor's degrees or higher, compared to the state average of 29.5%. The higher educational attainment rates range from a high of 16.6% in the City of Martinsville, to a low of 8.6% in Patrick County. These numbers, coupled with the population characteristics described in the previous paragraph, are important to keep in mind when developing public outreach programs. The content and delivery of public outreach programs should be consistent with the audiences' needs and ability to understand complex information.

The average median household income is approximately \$32,259, about 69% of the state average (\$46,677). The average per capita household income of \$17,450 is about 73% of the state per capita income of \$23,975. About 13.5% (33,157) of residents within the West Piedmont planning area live below the poverty line. This rate is higher than that of the national rate of 12.4% and the state rate of 9.6%. These numbers may indicate that a significant portion of the population will not have the resources to undertake mitigation projects that require self-funding.

The income statistics between jurisdictions in the planning area have a fairly wide range. Table IV-2 shows the breakdown by jurisdiction. As the table illustrates, Franklin County's median household income, the highest in the planning area, is almost 42% higher than the City of Danville's, the lowest in the planning area. Similar trends hold true for the per capita money income figures in the area. Percentages of people below the poverty level in the planning area are highest in the cities of Danville and Martinsville, both double the percentage of Virginia as a whole.

Table IV-2. Income Characteristics by Jurisdiction 5							
	Franklin County	Henry County	Patrick County	Pittsylvania County	City of Danville	City of Martins- ville	
Median household income, 1999	\$38,056	\$31,816	\$28,705	\$35,153	\$26,900	\$27,441	
Per capita money income, 1999	\$19,605	\$17,110	\$15,574	\$16,991	\$17,151	\$17,251	
Persons below poverty, percent, 1999	9.7%	11.7%	13.4%	11.8%	20.0%	19.2%	

Housing

There are 116,829 housing units in the planning area. Franklin, Henry and Pittsylvania Counties, and the City of Danville, each have about a 20% of the housing units, while Patrick County and the City of Martinsville contain approximately another 10% each. Only 11% of the housing units in the planning area are in multiunit structures, compared to the overall state percentage of 21.5%. Patrick and Pittsylvania Counties have less than 4%, while approximately 25% of the housing units in the Cities of Danville and Martinsville are multi-unit structures.

Almost 74% of residents own their own homes. Franklin County has the highest homeownership rate with 81.1% while the City of Danville has the lowest in the planning area at 58.1%. All of the homeownership rates of the Counties in the planning area are significantly higher than the national average of 66.2% or the state average of 68.1%, while both of the Cities fall below those averages. When considering mitigation options, special attention should be paid to the difference in capabilities between owners and renters. Table IV-3 illustrates the housing characteristics of each jurisdiction.

⁵ U.S. Census Bureau. *2000 U.S. Census*. Retrieved from http://www.census.gov

Table IV-3. Housing Characteristics by Jurisdiction								
	Franklin County	Henry County	Patrick County	Pittsylvania County	City of Danville	City of Martinsville		
Housing units, 2000	22,717	25,921	9,823	28,011	23,108	7,249		
Housing units in multi-unit structures, percent, 2000	7.3%	8.2%	3.9%	3.6%	24.2%	25.4%		
Homeownership rate, 2000	81.1%	76.9%	80.3%	80.1%	58.1%	60.2%		
Median value of owner-occupied housing units, 2000	\$105,000	\$75,500	\$75,300	\$80,300	\$71,900	\$69,100		

Business & Labor

Table IV-4 presents information on each jurisdiction's top employment sectors. The five most represented employment sectors are:

- Manufacturing,
- Services
- ❖ Retail trade
- ❖ Local government, and
- **.** Construction.

	Table IV-4. Employment by Sector by Jurisdiction ⁶													
Sector	Franklin	% of	Henry	% of	Patrick	% of	Pittsylvania	% of	Danville	% of	Martinsville	% of	West	% of
	County	Total	County	Total	County	Total	County	Total	City	Total	City	Total	Piedmont	Total
Agriculture	142	1.1%	72	0.4%	163	3.1%	191	1.2%	D	N/A	D	N/A	575	0.6%
Mining	D	N/A	D	N/A	D	N/A	D	N/A	D	N/A	D	N/A	130	0.1%
Utilities	D	N/A	D	N/A	D	N/A	D	N/A	D	N/A	D	N/A	245	0.3%
Construction	1,133	8.7%	628	3.6%	220	4.1%	1,721	10.8%	673	2.5%	256	2.0%	4,631	5.0%
Manufacturing	2,996	23.0%	7,691	44.5%	2,285	42.9%	6,349	39.7%	5,685	20.9%	1,960	15.1%	26,965	29.4%
Transportation	187	1.4%	1,137	6.6%	147	2.8%	299	1.9%	225	0.8%	109	0.8%	2,105	2.3%
Wholesale Trade	510	3.9%	304	1.8%	110	2.1%	494	3.1%	619	2.3%	134	1.0%	2,171	2.4%
Retail Trade	1,783	13.7%	1,675	9.7%	424	8.0%	1,572	9.8%	4,182	15.4%	2,991	23.1%	12,625	13.8%
Finance, Insurance, & Real Estate	395	3.0%	372	2.2%	93	1.7%	237	1.5%	1,229	4.5%	482	3.7%	2,806	3.1%
Services	D	N/A	D	N/A	D	N/A	D	N/A	D	N/A	D	N/A	26,796	29.2%
State Government	149	1.1%	491	2.8%	79	1.5%	235	1.5%	847	3.1%	207	1.6%	2,007	2.2%
Local Government	1,615	12.4%	1,775	10.3%	688	12.9%	1,855	11.6%	2,987	11.0%	1,274	9.8%	10,194	11.1%
Federal Government	113	0.9%	78	0.5%	51	1.0%	108	0.7%	152	0.6%	72	0.6%	573	0.6%
Nonclassifiable	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Total Employment	13,035	100.0%	17,291	100.0%	5,331	100.0%	15,991	100.0%	27,223	100.0%	12,947	100.0%	91,818	100.0%

⁶ <u>Automated Labor Information on the Commonwealth's Economy (ALICE), ES202 - Covered Employment & Wages (NAICS)</u>, Virginia Employment Commission, Economic Information Services, Richmond, VA. Retrieved from http://www.wppdc.org/Web_Data/WPPD_Ind03.htm on April 6, 2005.

Major employers in the jurisdictions include:

❖ Franklin County Franklin County School Board

MW Manufacturers

Wal Mart

Franklin County
Ferrum College

Franklin Memorial Hospital

❖ Henry County/

City of Martinsville Henry County School Board

Stanley Furniture Company

Memorial Hospital of Martinsville/Henry

County

Spring Industries

Bassett Furniture Industries Hooker Furniture Corporation

❖ Patrick County Patrick County School Board

Sara Lee Intimate Apparel

United Elastic

Roto Die Company, Inc. Stuart Flooring Corp.

Vaughan Furniture Company, Inc.

❖ Pittsylvania County Burlington Industries, Inc.

Columbia Forest Products, Inc.

Ennis Business Forms

Intertape Polymer Corporation Owens Brockway Glass Company Times Fiber Communication, Inc.

Blair Construction, Inc.

❖ City of Danville Dan River Fabrics

Danville Regional Medical Center Goodyear Tire & Rubber Company

Danville City Public Schools

City of Danville

Wal Mart

Agriculture

Agriculture is a major economic sector in the West Piedmont Planning District. As can be seen in Table IV-5, the amount of land farmed in two of the four counties remained relatively constant between 1997 and 2002, while Henry County decreased and Patrick County increased over the same period of time. Total agricultural sales were over \$110 million, mainly from livestock, poultry, and their products. Major crops include corn, tobacco and wheat. Significant quantities of cattle, as well as milk and dairy products are produced in the planning area.

Table IV-5. Agricultural Sector ⁷									
Market Value of Agricultural Products									
Jurisdiction	Land in farms -	Total value of	Value of crops	Value of					
	2002 acreage		including	livestock,					
	(change from 1997)	agricultural	nursery and	poultry, and					
	1997)	products sold	greenhouse	their products					
Franklin Co.	172,539 (+0%)	\$36,501,000	\$6,299,000	\$30,203,000					
Henry Co.	53,064 (-6%)	\$4,485,000	\$1,468,000	\$3,018,000					
Patrick Co.	90,569 (+9%)	\$15,227,000	\$6,745,000	\$8,482,000					
Pittsylvania Co.	288,647 (+1%)	\$ 54,593,000	\$30,695,000	\$23,898,000					

Transportation

The West Piedmont Planning District is at a crossroads of transportation within the south central portion of the state of Virginia. Four federal highways (U.S. Highways 29, 58, 220, and 360) and twenty state primary routes provide the localities of the Planning District with access to each other and the rest of the nation.

In addition, the region is served by Norfolk Southern rail lines, numerous truck lines, and air service from the Danville Regional Airport and Blue Ridge Airport (Henry County).

As described before, a number of rivers run through the planning area, but they are not used for commercial shipping. The nearest major commercial ports are in Richmond (150 miles to the northeast) and Norfolk, Newport News, and Portsmouth (200 miles to the east).

⁷ United States Department of Agriculture, Virginia Agricultural Statistics Service. *2002 Census of Agriculture. County Profiles.* Retrieved from http://www.nass.usda.gov/census/census02/profiles/va/index.htm

Infrastructure

The West Piedmont area is served primarily by Appalachian Power Company. Additional Electricity Providers in the area include: Dominion Virginia Power, Mecklenburg Electric Cooperative and Southside Electric Cooperative, as well the Cities of Danville and Martinsville. Natural gas is provided by Columbia Gas of Virginia, Southwestern Virginia Gas Company and the City of Danville. Telephone service is available from Verizon, Sprint/Centel, Citizens Telephone Cooperative and Peoples Mutual Telephone Company. Public water is available in many of the towns and cities in the planning area, as well as by the Pittsylvania County Service Authority, the Ferrum Water & Sewer Authority and the Henry County Public Service Authority. Franklin County is developing a utility system as well.

Wastewater treatment is provided by many of the towns, cities and service authorities that provide potable water. Private well and septic systems serve the remainder of the planning area.

SECTION V. Hazard Identification and Risk Assessment (HIRA) Introduction

Hazard mitigation is any sustained action taken to reduce or eliminate long term risk to life and property from a hazard event. In the past, federal legislation has provided funding for disaster relief, recovery, and some hazard mitigation planning. The Disaster Mitigation Act of 2000 (DMA2K) is the latest legislation to address this planning process. DMA2K was enacted on October 10, 2000, when President Clinton signed the Act (Public Law 106-390). The new legislation reinforces the importance of mitigation planning and emphasizes planning for disasters before they occur. As such, this Act establishes a pre-disaster hazard mitigation program and new requirements for the national Hazard Mitigation Grant Program (HMGP). States and local governments are required to adopt hazard mitigation plans in order to qualify for pre- and post-disaster federal hazard mitigation funding.

The West Piedmont Planning District Commission, on behalf of the jurisdictions which comprise the planning area, has developed this HIRA to serve as a guide to communities in the West Piedmont planning area when assessing potential vulnerabilities to natural hazards. When developing this plan, every effort was made to gather input from all aspects of the project area communities to assure that the results of this analysis will be as accurate as possible.

The planning area for this study includes two cities, four counties and seven incorporated towns. All jurisdictions located within these counties are included in this portion of the study, as this analysis has been completed on a regional basis. It should be noted, however that a local jurisdiction's inclusion in the full Mitigation Plan is dependent on the community's participation in the remainder of the planning process.

The purpose of the HIRA is to:

- Identify what hazards that could affect the West Piedmont region
- Profile hazard events and determine what areas and community assets are the most vulnerable to damage from these hazards
- Estimate losses and prioritize the potential risks to the community

The first step, identify hazards, describes all the natural and man-made hazards that might affect the planning area. The hazards were ranked to determine what hazards are most likely to impact the communities of the West Piedmont region. The hazards that were determined to have significant impact were analyzed in the greatest detail

to determine the magnitude of future events and the vulnerability for the community and for the critical facilities. Hazards that received a moderate impact ranking were analyzed with available data to determine the risk and vulnerability to the specified hazard. The limited impact hazards were analyzed using the best available data to determine the risk to the community.

West Piedmont Regional Description

The West Piedmont Planning District Commission (WPPDC) is located in southwest Virginia. The Blue Ridge Mountains border the western portion and the piedmont foothills border the eastern potion of the planning district.

Table V-1 and Figure V-1 illustrate the land area of each of the communities in the planning area as well as the populations in the community and number of households. This information will prove to be a key component in determining the risk to communities from natural hazards.

Table V-1. West Piedmont Planning District Commission Demographics (from US Census Bureau)								
Name	Area (Sq Mile)	1990 Pop	2000 Pop	2000 Pop per Sq Mile	2003 Pop	Median Home Value	Total Housing Units	
Danville City	43.23	53,056	48,411	1,120	46,371	\$69,800	23,108	
Franklin County	700.2	39,549	47,286	68	49,841	\$95,300	22,717	
Town of Boones Mill	0.55	239	285	518	289	\$89,000	138	
Town of Rocky Mount	4.56	4,098	4,066	892	4,555	\$79,700	1,796	
Henry County	378.33	56,942	57,930	153	56,940	\$69,500	25,921	
Town of Ridgeway	1.0	752	775	775	806	\$91,300	327	
Martinsville City	10.83	16,162	15,416	1,423	15,039	\$69,400	7,249	
Patrick County	478.21	17,473	19,407	41	19,239	\$70,500	9,823	
Town of Stuart	0.68	965	961	1,413	930	\$85,700	516	
Pittsylvania County	962.77	55,655	61,745	64	61,752	\$74,300	28,011	
Town of Chatham	2.01	1,354	1,338	666	1,302	\$82,500	612	
Town of Gretna	1.05	1,939	1,257	1,197	1,226	\$71,700	635	
Town of Hurt	2.63	1,294	1,276	485	1,248	\$80,900	592	

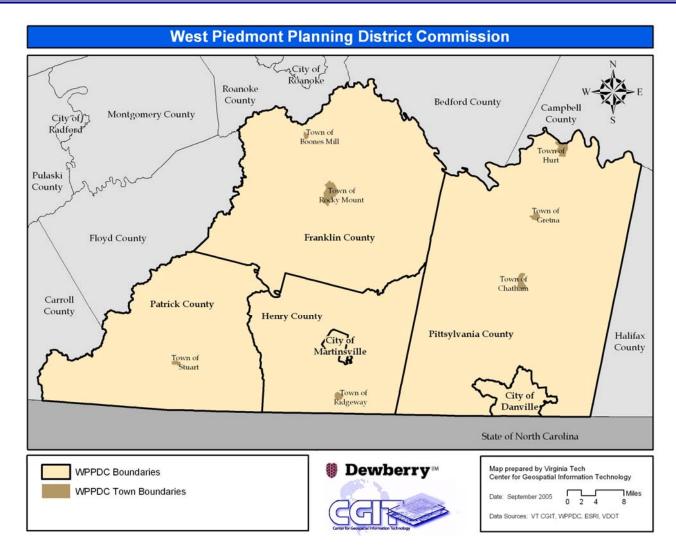


Figure V-1. West Piedmont Region Boundaries

Watersheds

The West Piedmont region is almost entirely within the Roanoke River Basin, with a small portion of Patrick County in the Yadkin River Basin. The western part of the planning area is bordered by the New River Basin. Figure V-2 illustrates the location of the major watershed boundaries for the planning district.

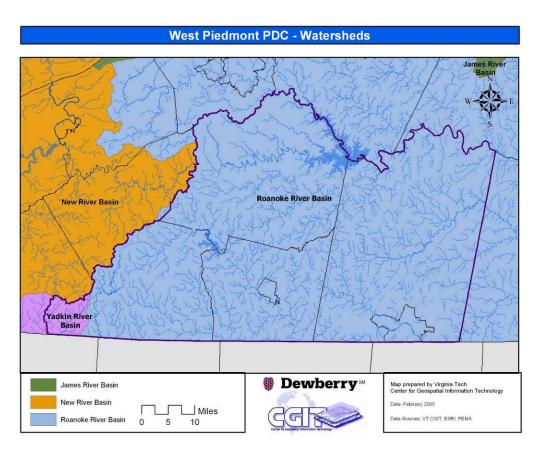


Figure V-2. West Piedmont Region Watersheds (from VA-DCR)

Critical Facilities

According to the FEMA State and Local Plan Interim Criteria, a critical facility is defined as a facility in either the public or private sector that provides essential products and services to the general public, is otherwise necessary to preserve the welfare and quality of life in the County, or fulfills important public safety, emergency response, and/or disaster recovery functions.

Critical facilities for WPPDC were derived from a variety of sources. Information provided by the Planning District Commission was supplemented with FEMA HAZUS-MH, ESRI and US Census data.

Data Limitations

The FEMA guidelines emphasize using "best available" data for this plan. The impact of these data limitations will be shown through the different vulnerability assessment and loss estimation methods used for hazards. The limiting factor for the data was the hazard mapping precision at only the county or jurisdiction level. The Planning District Commission provided available base map data including water networks, street mapping and some zoning information. All other data was derived from existing sources or created by the Virginia Tech Center for Geospatial Information Technology (CGIT). Critical facilities were determined based on best available data.

Inadequate information posed a problem for developing loss estimates for most of the identified hazards. Many of the hazards do not have defined damage estimate criteria. Critical facilities and residential and industrial buildings within the 100 year floodplain were identified for flood analysis. The HAZUS-MH model was used to estimate damage from hurricanes in the West Piedmont region.

Analysis for the region was completed using the best available data. Census blocks were used to assess the area's vulnerability to specific hazards. Flooding analysis was conducted in a slightly different manner. Structure value was established using average house value in the 2000 Census data because specific structure values were not available from the localities.

Hazard Identification

Types of Hazards

While nearly all disasters are possible for any given area in the United States, the most likely hazards that could potentially affect the communities in the West Piedmont Planning District generally include:

- Droughts
- Flooding
- Hurricanes
- Tornadoes
- Wildfires
- Winter Storms

The Mitigation Advisory Committee also wanted to include a qualitative assessment of the man-made or human-caused hazards that could affect the planning area. The human-caused hazards included in this plan are:

- Dams
- HVT Lines
- Organic/Inorganic Spills
- Pipelines
- Agriterrorism

Probability of Hazards

Hazards were ranked by the steering committee to determine what hazards they feel have the largest impact on their communities. The results are summarized in Table 2. Certain hazards were not addressed as a result of the infrequency of occurrence and/or limited impact. Earthquake, for example, falls into this category. Analysis level was determined by the type of data available and the scale of data available for the analysis.

Table V-2. West Piedmont Region Planning Consideration Levels							
Hazard Type	Planning Consideration Level						
Natural							
Winter Storms	Significant						
Flooding	Moderate						
Wind	Moderate						
Drought	Limited						
Hurricane	Limited						
Tornado	Limited						
Wildfire	Limited						
Earthquake	None						
Landslide/ Shoreline Erosion	None						
Human-Caused							
Dams	Significant						
HVT Lines	Moderate						
Organic/Inorganic Spills	Moderate						
Pipelines	Moderate						
Agriterrorism	Limited						

Major Disasters

Appendix B lists the major disasters that have occurred in the Planning District including Presidentially-declared disasters. It can be seen from the table which hazards have impacted the planning area.

Level of Hazard

Table 3 provides a breakdown of the natural hazards addressed in this plan. The level of planning consideration given to each hazard was determined by the committee members. Based on the input of committee members at the kick-off meeting, the hazards were separated into four distinct categories which represent the level of consideration they will receive throughout the planning process.

In order to focus on the most critical hazards that may affect the Planning District communities, the hazards assigned a level of *Significant* or *Moderate* received the most extensive attention in the remainder of the planning analysis, while those with a *Limited* planning consideration level were assessed in more general terms. Those hazards with a planning level of *None* are not addressed in this plan. The level of *None* should be interpreted as not being critical enough to warrant further evaluation; however, these hazards should not be interpreted as having zero probability or impact. Additional areas of impact were noted by the committee members through a problem spot worksheet as well as indicating what areas were of concern on paper maps for the region. The areas that the committee members indicated were taken into consideration during the analysis phase.

Table V-3. West Piedmont Region Natural Hazards HIRA Overview								
Туре	Detail Level	Analysis Level	Data Reference					
Including Winter Storms, Ice Storms, and Excessive Cold	Significant	Covered by HIRA winter storm analysis	NOAA National Weather Service Records, VirginiaView PRISM					
Riverine	Moderate	Covered by HIRA flood analysis	FEMA DFIRM, Q3, and FIRM Mapping					
Severe Storm Winds,	Moderate	Covered by HIRA hurricane	FEMA HAZUS-MH model					
	Type Including Winter Storms, Ice Storms, and Excessive Cold Riverine Severe Storm	Type Detail Level Including Winter Storms, Ice Storms, and Excessive Cold Riverine Moderate Severe Storm Winds,	Type Detail Level Analysis Level Including Winter Storms, Ice Storms, and Excessive Cold Riverine Moderate Covered by HIRA winter storm analysis Severe Storm Moderate Covered by HIRA flood analysis Severe Storm Moderate Covered by HIRA hurricane					

Table V-3. West Piedmont Region Natural Hazards HIRA Overview							
Hazard	Туре	Detail Level	Analysis Level	Data Reference			
	Thunderstorms and Lightning		tornado analysis				
	Hurricane	Limited	Covered by HIRA flood and hurricane wind analysis	FEMA DFIRM, Q3, and FIRM Mapping; ASCE Design Wind Speed Maps, FEMA HAZUS-MH model			
	Tornado, Including Hail	Limited	Description and Regional Maps	NOAA National Weather Service Records			
Drought	Including excessive heat	Limited	Covered by HIRA drought analysis	US Census Bureau 1990 Water Source Data			
Wildfire	Wildfire	Limited	Covered by HIRA wildfire analysis	Virginia Department of Forestry			
Earthquake	Earthquake	None	None, due to infrequency of occurrence	None			
Landslide/Land Subsidence/Ste ep Slopes	Landslide/Land Subsidence/Steep Slopes	None	None, due to infrequency of occurrence	None			
Human-Caused							
Dams	Dam Failure/Terroris m	Significant	Covered by HIRA dam analysis	National Dam Inventory, VA DCR			
HVT Lines	HVT Lines	Moderate	Description	FEMA			
Organic/Inorga nic Spills	Organic/Inorgan ic Spills	Moderate	Description	FEMA			
Pipelines	Pipelines	Moderate	Description	FEMA			
Agriterrorism	Agriterrorism	Limited	Descriptions and Regional Maps	US Department of Agriculture			

As indicated in Table V-4, earthquakes and landslide/land subsidence/steep slopes have been designated with a hazard level of None, and will not be included in this analysis. An earthquake is the shaking of the ground's surface caused by movements

of the plates beneath it. Though there have been historical occurrences of earthquakes that have affected the region, the probability and impact is low enough for the overall risk to be considered "none" at a planning level. This reasoning is supported by a loss estimate created using FEMA's HAZUS-MH that shows annualized losses for the region as about \$679,000. This number is compared to annualized losses from flood of \$4,835,928 or annualized losses from wind events at \$1,888,000.

The term "landslide" describes many types of downhill earth movements ranging from rapidly moving catastrophic rock avalanches and debris flows in mountainous regions to more slowly moving earth slides. Although the USGS landslide incidence and susceptibility map does identify a portion of the study area as having a moderate risk to landslides, the historic incidences and impacts of landslides in the region were considered by the planning team to be minor and not in need of consideration for this analysis.

Natural Hazards

The following sections address the impacts of natural hazards on the West Piedmont Planning District Commission. Each section will give a brief overview of the hazard event, historical dates and descriptions of past events, impacts of the events and a community-specific vulnerability analysis.

Severe Winter Storm (Significant Ranking)

Hazard History

Appendix B includes descriptions of major winter storm events in the West Piedmont region. Events have been broken down by the date of occurrence and when available, by individual community descriptions. When no community-specific description is available, the general description represents the entire planning area.

Hazard Profile

Primary Impacts

The impacts of winter storms are minimal in terms of property damage and long-term effects. The most notable impact from winter storms is the damage to power distribution networks and utilities. Severe winter storms have the potential to inhibit normal functions of the community. Governmental costs for this type of event are a result of the needed personnel and equipment for clearing streets. Private sector losses are attributed to lost work when employees are unable to travel. Homes and businesses suffer damage when electric service is interrupted for long periods of time.

For instance, winter storms have caused power outages over forty percent of Pittsylvania County in the past, with outages lasting up to five days. Five utility companies provide service to the county, which can make power restoration complicated.

Health threats can become severe when frozen precipitation makes roadways and walkways very slippery and also due to prolonged power outages and if fuel supplies are jeopardized. Occasionally, buildings may be damaged when snow loads exceed the design capacity of their roofs or when trees fall due to excessive ice accumulation on branches. The primary impact of excessive cold is increased potential for frostbite, and potentially death as a result of over-exposure to extreme cold.

Secondary Effects

Some of the secondary effects presented by extreme/excessive cold are threats to the health of livestock and pets, and frozen water pipes in homes and businesses.

Predictability and Frequency

Winter storms can be a combination of heavy snowfall, high winds, ice and extreme cold. These are classified as extra-tropical cyclones that originate as mid-latitude depressions. Winter weather impacts the state of Virginia between the months of November and April, with varied intensities from east to west. In order to create a statewide winter weather hazard potential map that captures this variability, gridded climate data was obtained from the Climate Source and through the VirginiaView program. This data was developed by the Oregon State University Spatial Climate Analysis Service (SCAS) using **PRISM** (Parameter-elevation Regressions on Independent Slopes Model). This climate mapping system is an analytical tool that uses point weather station observation data, a digital elevation model, and other spatial data sets to generate gridded estimates of monthly, yearly, and event-based climatic parameters.

The winter weather risk assessment uses monthly normal precipitation, mean annual days with snowfall greater than 1 inch, and mean monthly snowfall PRISM data to develop snow and ice potential maps for the state. These datasets incorporate topographic effects on precipitation, capture orographic rain shadows, and include coastal and lake effect influences on precipitation and snowfall. The monthly precipitation grid provides a 30-year climatological average of total precipitation in inches. The mean monthly snowfall grid provides a 30-year climatological average depth of freshly fallen snow in inches. The mean annual days map reveals the 30-year average of the number of days that a location will receive greater than 1 inch of snowfall in a 24-hour period in a given year.

A criterion of greater than 1 inch was selected for winter snowfall severity assessment because this depth will result in complete road coverage that can create extremely dangerous driving conditions and will require removal by the local community. This amount of snowfall in a 24-hour period also can lead to business closure and school delays or cancellation. Figure V-3 shows the average number of days with snowfall greater than one inch for the state and Figure V-4 shows the same for the West Piedmont region.

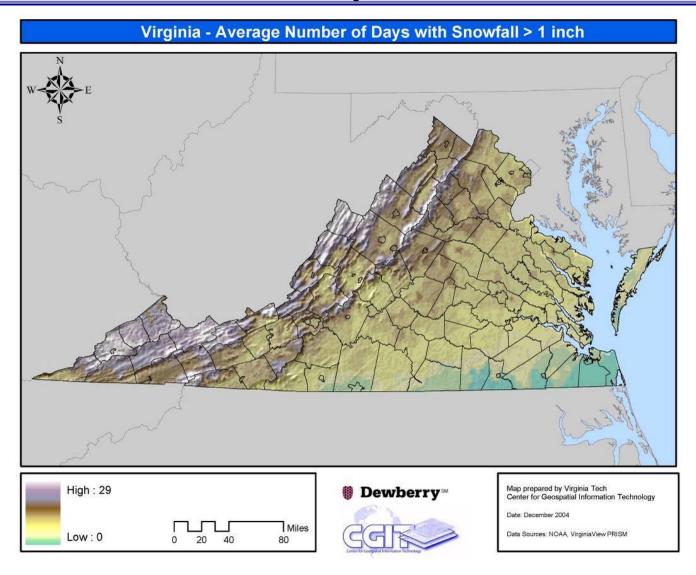


Figure V-3. Virginia Average Number of Days with Snowfall > 1 inch

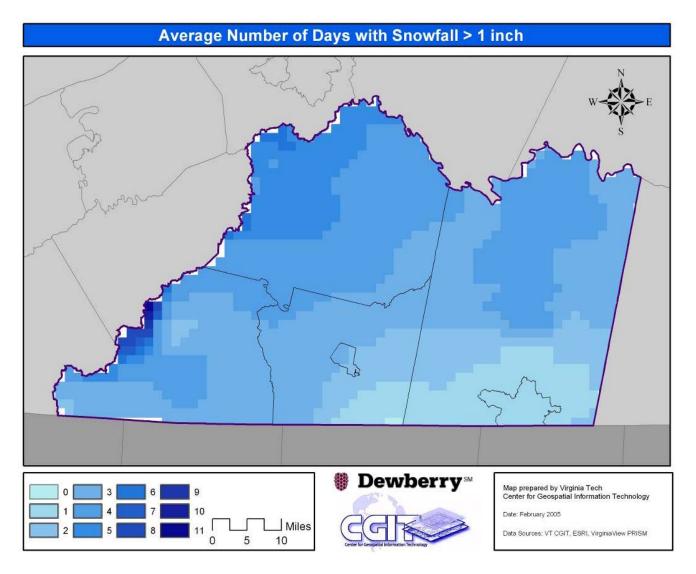


Figure V-4. West Piedmont Average Number of Days with Snowfall > 1 inch.

Ice Potential

Another challenge with winter weather in Virginia and the West Piedmont region is the amount of ice that often comes as part of winter weather. Snowfall and ice potential were generated based on the percentage difference between the total precipitation from November to April and the corresponding liquid equivalent snowfall depth. Since snowfall is in a frozen state, it does not accumulate on the surface the same way that liquid rainfall does. In order to account for this difference, characteristic snow/rain relationships have been created. For example, a value of 1 would mean that all of the precipitation at the location falls as liquid rainfall, and a value of 0.5 would mean that half of the precipitation falls as liquid rainfall and half falls as frozen precipitation. It is assumed that the lower this percentage, the greater potential that precipitation within these months is falling as snow. The values in the middle of the two extremes would represent regions that favor ice conditions over rain and snow. A five quantile distribution was applied to the output statewide grid to split the percentages into five characteristic climatological winter weather categories (snow, snow/ice, ice, rain/ice, and rain). Figure V-5 shows the statewide map and Figure V-6 show the West Piedmont Region regional map.

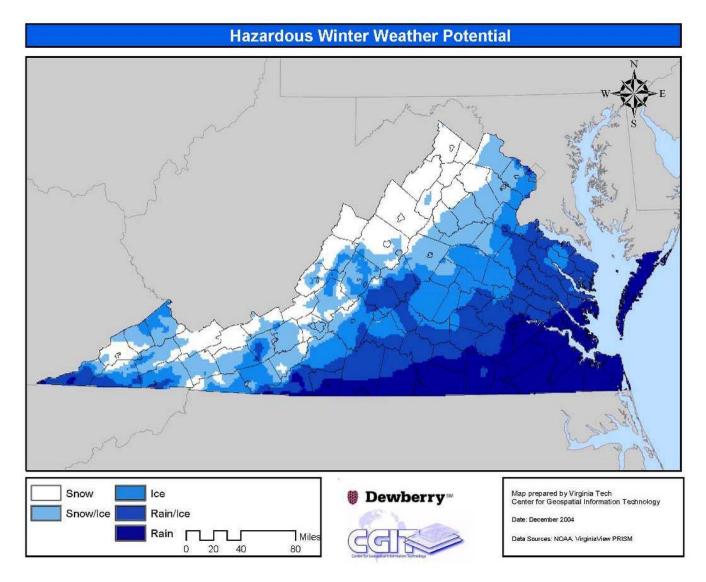


Figure V-5. Virginia Hazardous Winter Weather Potential Based on LEQ Precipitation

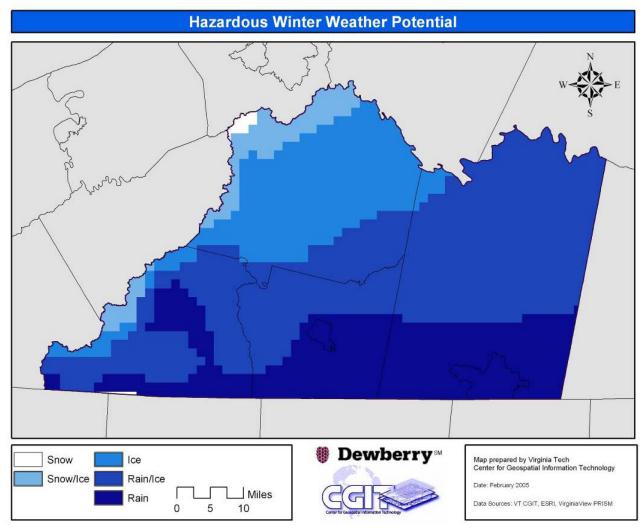


Figure V-6. West Piedmont Hazardous Winter Weather Potential Based on LEQ Precipitation

Vulnerability Analysis

Figures V-4 and V-6 show the overall snow and ice potential for the West Piedmont region. Figures V-7 and V-8 show relative risk or vulnerability based on these previous maps. The planning areas were assigned a relative risk of high, medium and low based on the levels predicted from risk potential maps. The categories were developed by assigning a high risk to those census blocks within the regions with the greatest potential for snowy days (> 1 in of snow) or ice. Appendix B contains the relative snow and ice potential maps for each of the localities in the region. Winter weather mapping resolution does not support detailed town-based analysis, since most towns in the region currently are be represented by one or two pixels at this resolution. Town-based analysis could become possible in the future if weather data with better spatial resolution becomes available. Tables V-4 and V-5 show the population in each county, city and town impacted by the overall snowfall and ice risks. County totals include the town subtotals.

The maps and tables included in Appendix B summarize the problem spot locations that are denoted on the maps by community officials. Future revisions of this plan should include a method to calculate the potential loss from these winter storms.

Overall, the majority of the region has a medium potential for ice and a relatively low potential for snow. Areas of high ice potential are located in Franklin County and the towns of Boones Mill and Rocky Mount. Portions of Henry County, the cities of Martinsville and Danville and the area around the Town of Chatham have relatively low potential for ice. The portion of the planning area bordering the Blue Ridge Mountains has the highest potential for snow; in particular, the northwestern portion of Patrick County has a high potential for snow.

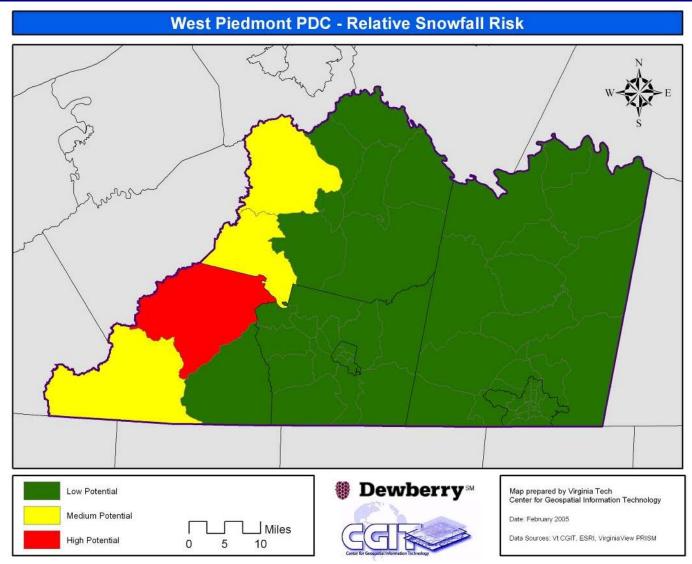


Figure V-7. West Piedmont Snowfall Relative Risk

Table V-4. West Piedmont Population Snowfall Relative Risk (from 2000 Census)								
Jurisdiction	Low	Medium	High	TOTAL				
Danville City	48,411	0	0	48,411				
Franklin County	37,311	9,975	0	47,286				
Town of Boones Mill	130	155	0	285				
Town of Rocky Mount	4,066	0	0	4,066				
Henry County	57,930	0	0	57,930				
Town of Ridgeway	775	0	0	775				
Martinsville City	15,416	0	0	15,416				
Patrick County	7,347	6,540	5,520	19,407				
Town of Stuart	0	0	961	961				
Pittsylvania County	61,745	0	0	61,745				
Town of Chatham	1,338	0	0	1,338				
Town of Gretna	1,257	0	0	1,257				
Town of Hurt	1,276	0	0	1,276				
TOTAL	228,160	16,515	5,520	250,195				

Table V-5. West Piedmont Region Population Ice Relative Risk (from 2000 Census)								
Jurisdiction	Low	Medium	High	Total				
Danville City	48,411	0	0	48,411				
Franklin County	0	13,028	34,258	47,286				
Town of Boones Mill	0	130	155	285				
Town of Rocky Mount	0	4,066	0	4,066				
Henry County	20,411	37,519	0	57,930				
Town of Ridgeway	0	775	0	775				
Martinsville City	15,416	0	0	15,416				
Patrick County	0	19,407	0	19,407				
Town of Stuart	0	961	0	961				
Pittsylvania County	31,504	30,241	0	61,745				
Town of Chatham	1,338	0	0	1,338				
Town of Gretna	0	1,257	0	1,257				
Town of Hurt	0	1,276	0	1,276				
TOTAL	115,742	100,196	34,258	250,195				

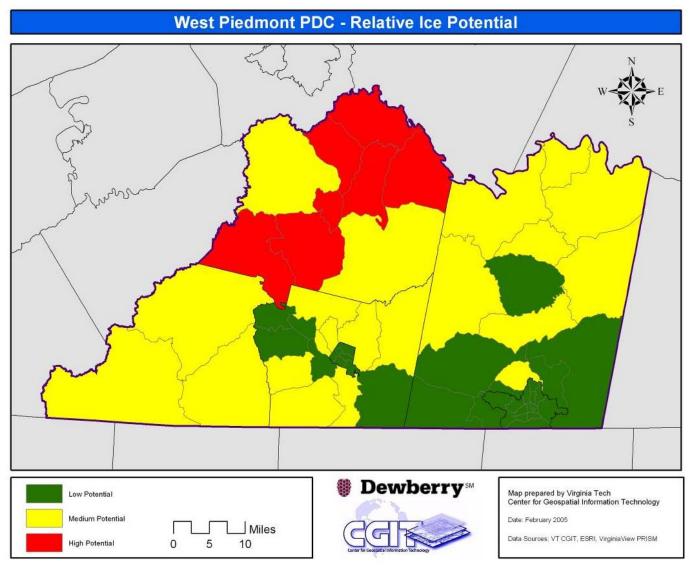


Figure V-8. West Piedmont Region Ice Relative Risk

Flooding (Moderate Ranking)

Hazard History

Appendix B includes descriptions of major flood events in the West Piedmont Region. Events have been categorized by the date of occurrence and when available, by individual community descriptions. When no community-specific description is available, the general description represents the entire planning area.

Hazard Profile

A flood occurs when an area that is normally dry becomes inundated with water. Floods may result from the overflow of surface waters, overflow of inland and tidal waters, or mudflows. Flooding can occur at any time of the year, with peak hazards in the late winter and early spring. Snowmelt and ice jam breakaway contribute to winter flooding, while seasonal rain patterns contribute to spring flooding. Torrential rains from hurricanes and tropical systems are more likely in late summer. Development of flood-prone areas tends to increase the frequency and degree of flooding.

Floods typically are characterized by frequency, for example the "1%-annual chance flood," commonly referred to as the "100-year" flood. While more frequent floods do occur, as well as larger events that have lower probabilities of occurrence, for most regulatory and hazard identification purposes, the 1%-percent annual chance flood is used.

Floods pick up chemicals, sewage and toxins from roads, factories, and farms. Property affected by the flood may be contaminated with hazardous materials. Debris from vegetation and man-made structures also may be hazardous following the occurrence of a flood. In addition, floods may threaten water supplies and water quality, as well as initiate power outages.

Secondary Effects

Flooding can pose some significant secondary impacts to the area where the event has taken place. Some of the impacts to consider include infrastructure and utility failure, impacts to roadways, water service and wastewater treatment. These impacts can affect the entire planning district, making the area vulnerable to limited emergency services.

Flood Maps

Detailed flood data were available as "Q3 flood maps" for two of the communities in the region. The Q3 flood maps are digital versions of the FEMA paper FIRMs that

have been georectified and digitized. For the communities where Q3 data were not available, paper copies of the FEMA Flood Insurance Rate Maps (FIRMs) were scanned, georectified and digitized. Figure V-9 illustrates the extent of FEMA-mapped flood zones.

Vulnerability Analysis

Specific areas that are susceptible to flooding were identified during the West Piedmont Mitigation Advisory Committee kick-off meeting. These areas were taken into account when completing the hazard identification and risk assessment.

Many factors contribute to the relative vulnerabilities of areas within the floodplain. Some of these factors include development or the presence of people and property in the floodplain, flood depth, velocity, elevation, construction type and flood duration.

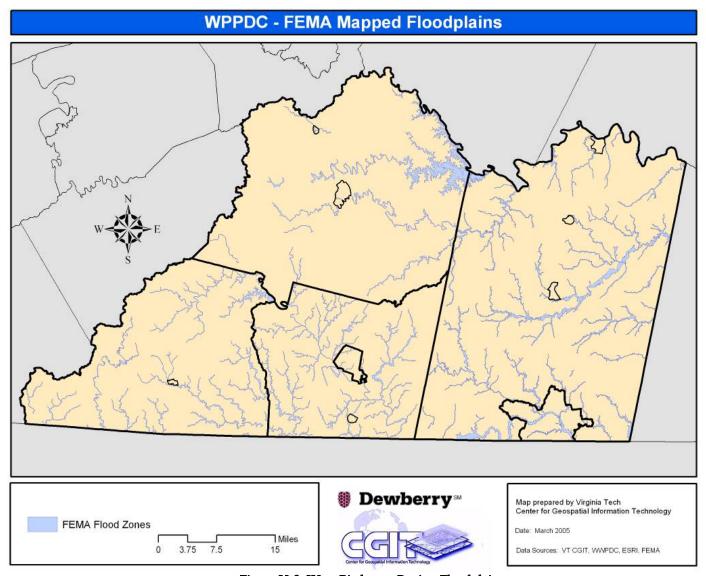


Figure V-9. West Piedmont Region Floodplains

Hazard Areas and Vulnerability Assessment by Jurisdiction

Flooding in the West Piedmont region tends to be riverine in nature along the tributaries of the Roanoke River. Localized flooding also can occur in the narrow valleys throughout the area and because of local drainage areas, particularly in the more urban areas.

Several of the comprehensive plans for the West Piedmont area provided some description of vulnerable areas. In the City of Danville, the Piedmont Drive/Mt. Cross Road Planning Area is impacted by three major waterways: the Dan River, Sandy River and Sandy Creek. According to the Comprehensive Plan, this area has been flooded numerous times. The area along Riverside Drive and Mt. Cross Road in Danville Plaza has been a particular concern. A portion of the planning area in the 100-year floodplain has been identified as a potential park location. The Dan River also significantly impacts the Downtown and the Airport/Industrial Airport Planning Areas, bisecting the latter Planning Area.

Street flooding is also an issue in the City of Danville. For instance, Route 58 Business at Fall Creek is often closed after heavy rainfall. The floodwaters result from runoff from the adjacent neighborhood that comes up through the manholes. If the rainfall amount is large enough, the adjacent river also may flood its banks adding to the floodwaters on the road. Apple Branch also causes flooding on Arnett Boulevard because of inadequate culverts. In addition, underground culverts run under buildings in downtown Danville. These culverts are antiquated and are at risk of collapse.

The City of Danville's Utilities Department is considering moving the water, gas, and electric substation because the current building is too small. In addition, the parking lot has flooded numerous times (e.g., at least three times per decade). The Utilities Department has not been able to identify a location to move its facilities to however, so is considering rehabilitating the existing building.

According to Pittsylvania County officials, flooding is the county's primary natural hazard concern. Rapid rising creeks, in particular, cause low-lying roads to be flooded. For instance, Highway 29 at Fall Creek has repeatedly flooded in the past during large rainfall events. The cause of the flooding is unclear.

In Martinsville, the Westside and Southside neighborhoods have concerns about stormwater management. After large rains, it is not uncommon for unmarked barrels

to float down the river and collect in Smith Mountain Lake, located in Franklin County. These unmarked barrels may pose a health hazard if their contents are toxic.

Structures at Risk

The impact of flooding on structures was estimated based on best available data for floodplains and structures for each community. Table V-6 shows the sources for the structure values used for the flood loss analysis. The average structural value per census block from HAZUS-MH was used because the value information provided by the localities was not in a usable format for this analysis.

Table V-6. Wes	Table V-6. West Piedmont Region Structural and Property Data Availability						
Jurisdiction	Structural and Property Data						
Danville City	GIS building footprints without values. Average building value derived from HAZUS-MH census blocks.						
Franklin County	Average building value per census block from FEMA HAZUS-MH.						
Town of Boones Mill	Average building value per census block from FEMA HAZUS-MH.						
Town of Rocky Mount	Average building value per census block from FEMA HAZUS-MH.						
Henry County	GIS building footprints without values. Average building value derived from HAZUS-MH census blocks.						
Town of Ridgeway	GIS building footprints without values. Average building value derived from HAZUS-MH census blocks.						
Martinsville City	GIS building footprints without values. Average building value derived from HAZUS-MH census blocks.						
Patrick County	Average building value per census block from FEMA HAZUS-MH.						
Town of Stuart	Average building value per census block from FEMA HAZUS-MH.						
Pittsylvania County	GIS tax parcels without values. Average building value derived from HAZUS-MH census blocks.						
Town of Chatham	GIS tax parcels without values. Average building value derived from HAZUS-MH census blocks.						
Town of Gretna	No published FEMA FIRM available.						
Town of Hurt	GIS tax parcels without values. Average building value derived from HAZUS-MH census blocks.						

The flood vulnerability was determined for each locality based on the intersection of floodplain mapping and structure value mapping. This varied by community based on the data availability. In communities where building footprints for structures were known, the intersection analysis showed which structures were entirely or partially within the floodplain. In communities where parcel map layers existed, the mapping intersection determined which parcels were partially or entirely in the floodplain. For the counties were census block-level mapping only was available, the mapping intersection showed which census blocks were partially or entirely within the floodplain. Based on the mapping intersection and the number of households and housing units in the census block, an estimate was made of the total structures flooded in each census block.

Table V-7 lists the total replacement value of structures vulnerable to flooding (both partially and entirely within the floodplain) in each community. These replacement values for structures were calculated as 10% greater than the HAZUS-MH census block average values. These values are likely to be underestimates, especially for any non-residential structures in the floodplain.

Table V-7. Structure Value Vulnerability						
Jurisdiction	Total Structure Value Vulnerability					
Danville City	\$21,006,810					
Franklin County	\$92,626,160					
Town of Boones Mill	\$1,816,760					
Town of Rocky Mount	\$4,895,660					
Henry County	\$91,005,970					
Town of Ridgeway	\$508,200					
Martinsville City	\$5,164,830					
Patrick County	\$19,232,510					
Town of Stuart	\$275,550					
Pittsylvania County	\$476,466,980					
Town of Chatham	\$3,377,440					
Town of Gretna	No published FEMA FIRM available.					
Town of Hurt	\$2,789,820					
Total	\$705,503,260					

Critical Facilities

Table V-8 lists the critical facilities that are located within or in close proximity to the FEMA designated floodplains. Using a GIS, the critical facility points were intersected with the FEMA flood zones. A 30-foot buffer on the facilities provided a radial distance from the center of the building that was used to determine the proximity to the floodplain. While Table V-8 shows that only fifteen facilities are located near or in the floodplain, there is great diversity in the types of facilities.

Table V-8. West Piedmont C	ritical Facilities within the	e Floodplain			
Facility Name	Туре	Jurisdiction			
Biokinetics Rehab Inc.*	Medical Center	Danville City			
Danville Women's Care PC*	Medical Center	Danville City			
Family Healthcare Center*	Medical Center	Danville City			
Boones Mill Post Office	Government Facility	Franklin County			
Callaway Elementary School	School	Franklin County			
Callaway Fire Department	Fire	Franklin County			
Callaway Rescue Squad	Rescue	Franklin County			
Franklin County Post Office	Government Facility	Franklin County			
Bassett Rescue Squad	Rescue	Henry County			
Stanleytown Elementary School	School	Henry County			
Pump Station at Mount Olivet Rd and Old Liberty Drive	Utility	Henry County			
Pinnacles Power Plant	Power Plant	Patrick County			
Highway 57 Compactor	Compactor	Pittsylvania County			
Leesville Lake Dam	Dam	Pittsylvania County			
Lighthouse Full Gospel Church Church Pittsylvania Count					
*Community officials note that actual b	ouilding is not within flo	odplain though			
portion of the parcel does intersect floo	dplain.				

Estimating Losses

Using the property values from Table V-7, an estimate of the potential flood loss for each community was developed. Losses included structure and contents damage using a method based on FEMA Benefit-Cost Analysis. Contents values were estimated as 30% of the building value. Structural damage percentages were based on portion of the parcel or census block that was in the floodplain. Table V-9 shows how the basis for these damage percentages and how they were assigned depending on the mapping detail.

	Table V-9. Flood Damage Classes							
Flood Damage Class	100-yr % Structural Damage	Representative Flood Depth Range	Mapped Parcels in Floodplain	Mapped Census Blocks in Floodplain				
1	11%	0 to +1 ft	< 33%	< 33%				
2	20%	+1 to + 3 ft	33% - 66%	33% - 66%				
3	28%	> 3 ft	> 66 %	> 66 %				

Contents damages were estimated as 50% greater than the structural damage percentage. These values were used to predict the damage from a 100-year flood event for the structure. To calculate an annualized flood damage estimate, it was assumed for each structure damages began with a 25-year event. A percentage of the 100-year flood damage value was used for events less frequent than the 100-year event.

For example, a parcel is determined to have a structure worth \$100,000 based on the HAZUS-MH census block average values. The replacement value of the structure would be \$110,000 and the contents value \$33,000. Based on the mapping analysis, it is determined that 45% of the parcel is in the floodplain. Using the classification scheme described above, the structure would be in Flood Damage Class 2, with 20% 100-year structure damage and the 30% contents damage. The damage from a 100-year flood would equal \$22,000 structural plus \$9,900 contents or a total of \$31,900. Figure V-10 shows the probability assumptions are used to estimate the annualized loss at \$797.50.

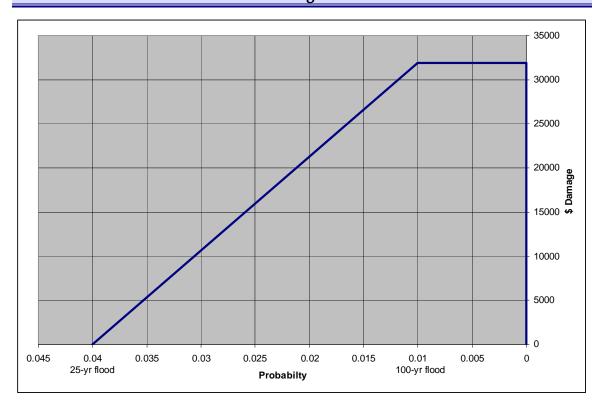


Figure V-10. Example of Flood Loss Estimate Technique

Table V-10 provides the total flood loss estimates for each jurisdiction.

Table V-10. Annualized Structure and Contents Loss Estimates									
Jurisdiction	Total Loss Estimate	Percentage of Total Structure Value							
Danville City	\$180,256	0.86%							
Franklin County	\$354,065	0.38%							
Town of Boones Mill	\$11,949	0.66%							
Town of Rocky Mount	\$16,328	0.33%							
Henry County	\$790,182	0.87%							
Town of Ridgeway	\$5,052	0.99%							
Martinsville City	\$40,445	0.78%							
Patrick County	\$83,197 0.43%								
Town of Stuart	\$883	0.32%							
Pittsylvania County	\$3,187,783	0.67%							
Town of Chatham	\$22,564 0.67%								
Town of Gretna	No published FEMA FIRM available.	No published FEMA FIRM available.							
Town of Hurt	\$20,200	0.72%							
Total	\$4,635,928	0.66%							

One limitation of this analysis method is that it underestimates the loss to higher-valued structures, such as businesses and critical facilities. When this method was used for these multi-million dollar structures, the loss estimates were unrealistic, since many of these structures in the vicinity of the floodplain may be elevated or have floodproofing measures in place which would reduce damages. Therefore, the maximum amount of damage for individual structures was capped at \$400,000 from a 100-year storm event (which translates into \$10,000 as an annualized loss). The values in Table V-10 reflect this assumption.

Figure V-11 shows the census blocks where these losses occur. Appendix B includes the individual jurisdiction maps and descriptions of problem spots identified by the Mitigation Advisory Committee members. While most of the flood prone census blocks have less than \$10,000 annual flood losses, there are a select locations in Pittsylvania County with estimated losses of between \$20,000 and \$39,999 and one census block with over \$40,000 in estimated losses. Table V-10 shows the annualized loss estimate for damage to structures and contents, broken down by community. As

shown in the table, Pittsylvania County makes up 69% of the total estimated damage amounts followed by Henry County with 17% of the total estimated damage amount. Figure V-11 illustrates the distribution of annualized flood damage for the planning area. Most census blocks with flood damage fall into the less than \$20,000 in annual damages category.

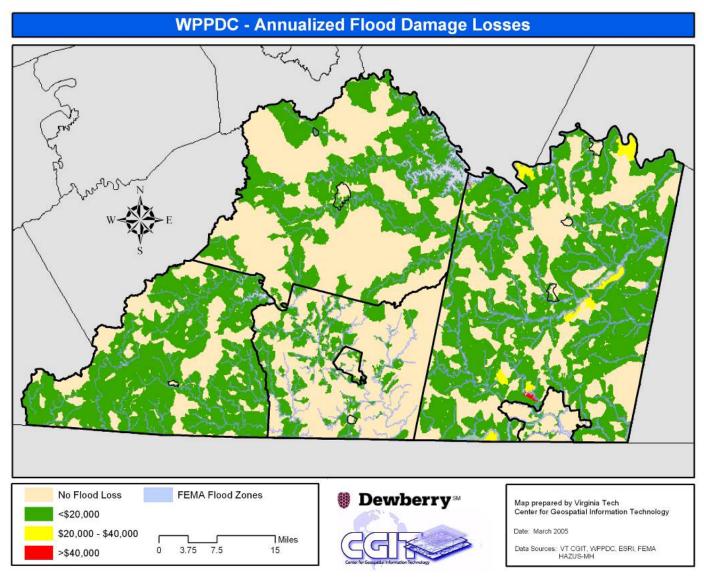


Figure V-11. West Piedmont Region Flood Losses by Census Blocks

Appendix B contains the annualized flood damage maps for each of the localities in the region. It should be noted that no FEMA floodplain maps exist for the town of Gretna, therefore, no annualized flood damage loss map is included for the town. Each region is unique in their exposure to flooding. The following is a summation of the major trends illustrated on the jurisdictional specific maps:

- The counties of Pittsylvania, Franklin and Henry have the highest annualized structure and content damages for the planning district. One of the reasons for the high loss values is attributed to the structure value that is potentially vulnerable to flooding.
- The city of Danville, with a total loss estimate greater than \$180,000, acquires most of its damage from the Dan River and Pumpkin Creek.
- Franklin County, with a majority of census blocks along main stream braches, receives flood losses in the less than \$20,000 damage category. Smith Mountain Lake attributes to a large percentage of the annualized damages for the northeastern portion of the county.
- Maggodee Creek runs through the center of Boones Mill and is the primary cause of the town's flood losses.
- Pigg River forms the southeast boarder for the Town of Rocky Mount. The southeast portion of the town receives less than \$20,000 annualized damages per census block.
- Henry County has numerous streams within its borders, accounting for the high flood losses. The Philpott Reservoir is located to the southwest tip of the county.
- The town of Ridgeway has very limited sources for flood loss; with small sections of Surry Martian Branch and Tributary of Marrowbone Creek touching the town bounds.
- The City of Martinsville is fortunate to have modest damages due to flooding. Some of the streams within the city are Jones Creek, Smith River and Mulberry Creek.
- A majority of the census blocks for Patrick County have some degree of flood loss.
 The Philpott Reservoir is located in the northeast corner of the county. Some of
 the major stream braches in the county are Smith River, Rock Castle Creek, North
 and South Mayo Rivers, Dan River and Poorhouse Creek.
- The Town of Stuart receives a majority of the flood losses around the perimeter of the town from Poorhouse Creek and South Mayo River.
- Pittsylvania County receives the highest flood damages for the planning district. The county has quite a few census blocks that have damages ranging from \$20,000 to over \$40,000. Smith Mountain Lake, in the northeast corner of the county, accounts for a large percentage of the flood losses, with the highest census block loss of \$61,746. The high predicted damage levels along the lake are likely a by-

product of the poor flood map quality along the many coves and inlets along the lake. The second highest damage in a census block is located along Sandy Creek, with damages estimates at \$42,366. Pittsylvania County, as compared to the other counties in the commission, has longer floodplain lengths and relatively higher property values, resulting in the overall high loss prediction. Additional high damage areas are located along the Dan River, Banister River and North Roanoke River. Further refinement of the flood maps and floodplain boundaries through the FEMA Map Modernization Program will likely reduce these predicted losses.

- The Town of Chatham receives most of its flood damages from Cherrystone Creek located in the western portion of the town.
- The Town of Hurt is bordered by the Roanoke River to the north and east and Sycamore Creek to the west. The census blocks with flood losses are located on the north and southeast sides of the town.

FEMA-Designated Repetitive Loss Properties

There are 32 repetitive loss properties in the West Piedmont region, with an average payment of \$36,824 per structure (Appendix B). A majority of the repetitive loss structures for the West Piedmont region are single family homes, though the structures with the highest claims paid are non-residential.

Wind (Moderate Ranking)

The analysis in this plan focuses on hurricane and tornado winds as the most likely type of wind hazards to occur in the planning area, though damage from high winds also can be caused by straight line wind events and thunderstorms. Appendix B indicates general wind historical events for the region.

Hurricane and Extreme Wind (Limited Ranking)

Hazard History

Appendix B includes descriptions of major hurricane events in the West Piedmont region. Events have been down categorized by the date of occurrence and when available, by individual community descriptions. When no community specific description is available, the general description represents the entire planning area.

The Commonwealth of Virginia's Standard Hazard Mitigation Plan includes hurricane tracks in Virginia spanning from 1851 to 2003 (Figure V-12). The hurricane track map gives an idea of the historical occurrences in the West Piedmont region. The figure shows that very few hurricanes have tracked through the communities of the West Piedmont region.

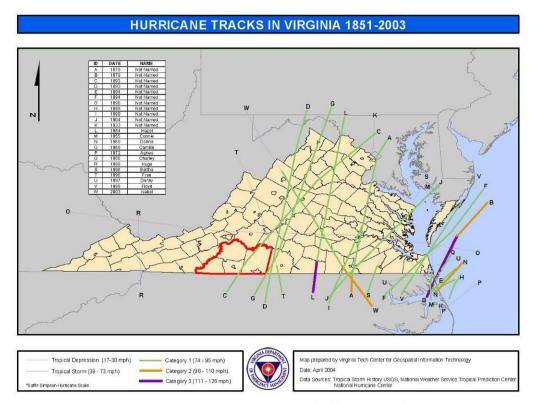


Figure V-12. Virginia Hurricane Tracks (from VDEM)

Hazard Profile

A tropical cyclone is the generic term for a non-frontal synoptic scale low-pressure system over tropical or sub-tropical waters with organized convection and definite cyclonic surface wind circulation. Depending on strength, these weather systems are classified as hurricanes or tropical storms. Tropical cyclones involve both atmospheric and hydrologic characteristics, such as severe winds, storm, surge flooding, high waves, coastal erosion, extreme rainfall, thunderstorms, lightning, and, in some cases, tornadoes. Storm surge flooding can push inland, and riverine flooding associated with heavy inland rains can be extensive. High winds are associated with hurricanes, with two significant effects: widespread debris due to damaged and downed trees and damaged buildings and power outages.

Secondary Hazards

Secondary hazards from a hurricane event could include high winds, flooding, heavy waves, and tornadoes. Once inland, the hurricane's band of thunderstorms produces torrential rains and may produce tornadoes. A foot or more of rain may fall in less than a day causing flash floods and mudslides. The rain eventually drains into the large rivers which may still be flooding for days after the storm has passed. The

storm's driving winds can topple trees, utility poles, and damage buildings. Communication and electricity is lost for days and roads are impassable due to fallen trees and debris.

Hurricane Damage Scale

Hurricanes are categorized by the Safer-Simpson Hurricane Damage Scale. Detailed descriptions of each category and the potential damage are provided in Table V-11.

	Table	V-11. Saffir-Sim	apson Hurricane Damage Scale
Hurricane Category	Sustained Winds (mph)	Damage Potential	Description
1	74 - 95	Minimal	Minimal damage to unanchored mobile homes along with shrubbery and trees. There may be pier damage and coastal road flooding, with storm surge 4-5 feet about average.
2	96 - 110	Moderate	Moderate damage potential to mobile homes and piers, as well as significant damage to shrubbery and tress with some damages to roofs, doors and windows. Impacts include flooding 2-4 hours before arrival of the hurricane in coastal and low lying areas. Storm surge can be 6-8 feet above average.
3	111 - 130	Extensive	Extensive damage potential. There will be structural damage to small residences and utility buildings. Extensive damage is to mobile homes and trees and shrubbery. Impacts include flooding 3-5 hours before the arrival of the hurricane cutting off the low lying escape routes. Coastal flooding has the potential to destroy the small structures, with significant damage to larger structures as a result of the floating debris. Land that is lower than 5 feet below mean sea level can be flooded 8 or more miles inland. Storm surge can be 6-12 feet above average.
4	131 - 155	Extreme	Extreme damage potential. Curtain wall failure as well as roof structure failure. Major damage to lower floors near the shoreline. Storm surge generally reaches 13-18 feet above average.
5	> 155	Catastrophic	Severe damage potential. Complete roof failure on residence and industrial structures, with complete destruction of mobile homes. All shrubs, trees and

Table V-11. Saffir-Simpson Hurricane Damage Scale						
Hurricane Category	Sustained Winds (mph)	Damage Potential	Description			
			utility lines blown down. Storm surge is generally greater than 18 feet above average.			

Vulnerability Analysis

HAZUS-MH was used to complete the wind analysis for vulnerability and loss estimates. The HAZUS software has been developed by FEMA and the Nation Institute of Building Sciences. Level 1, with default parameters, was used for the analysis done in this plan. For analysis purposes, the U.S. Census tracks are the smallest extent in which the model runs. The results of this analysis are captured in the vulnerability analysis and loss estimation.

HAZUS-MH uses historical hurricane tracks and computer modeling to identify the probable tracks of a range of hurricane events. Appendix B3 includes the individual wind speed maps (50-yr, 100-yr, and 1,000-yr events) for the jurisdictions in the region. Results from the model were used to develop the annualized damage estimates. The impacts of these various events are combined to create a total annualized loss or the expected value of loss in any given year. Figure V-16 illustrates the annualized damages from hurricane winds.

Building Types

Table V-12 illustrates the probabilistic building stock exposure by building type to hurricanes. For the West Piedmont region, wood building frames account for a large percentage of the building stock (59%). Table V-13 illustrates the building stock exposure categorized by occupancy type. As seen in Table V-13, 82% of the building stock for the West Piedmont region is considered residential, with approximately 15% of the building stock classified as commercial and industrial.

The HAZUS-MH hurricane model only conducts analysis at the U.S. Census track level, which is larger than most of the towns in the region. Town exposure in Tables V-12 through V-15 has been estimated based on the percentage of the housing units in the county.

Table V-12. Building Stock Exposure by Building Type (from HAZUS-MH)								
	Buil	ding Stock Expos	sure by Building	у Туре				
Jurisdiction	Wood	Masonry	Concrete	Steel	MH	TOTAL		
Danville City	\$1,895,335.00	\$845,320.00	\$120,487.00	\$326,093.00	\$33,175.00	\$3,220,410.00		
Franklin County	\$1,695,581.00	\$684,466.00	\$71,701.00	\$222,712.00	\$165,885.00	\$2,840,345.00		
Town of Boones Mill	\$10,219.53	\$4,125.38	\$432.15	\$1,342.32	\$999.81	\$17,119.20		
Town of Rocky Mount	\$145,798.59	\$58,855.45	\$6,165.38	\$19,150.42	\$14,264.02	\$244,233.87		
Henry County	\$1,943,616.00	\$844,429.00	\$92,014.00	\$387,638.00	\$188,387.00	\$3,456,084.00		
Town of Ridgeway	\$26,002.11	\$11,296.95	\$1,230.98	\$5,185.90	\$2,520.28	\$46,236.24		
Martinsville City	\$637,672.00	\$311,306.00	\$62,026.00	\$169,534.00	\$623.00	\$1,181,161.00		
Patrick County	\$685,797.00	\$277,840.00	\$29,509.00	\$96,866.00	\$83,508.00	\$1,173,520.00		
Town of Stuart	\$33,959.44	\$13,758.14	\$0.00	\$4,796.63	\$4,135.17	\$56,649.38		
Pittsylvania County	\$2,015,078.00	\$765,272.00	\$40,233.00	\$163,997.00	\$231,797.00	\$3,216,377.00		
Town of Chatham	\$43,666.28	\$16,583.27	\$871.84	\$3,553.78	\$5,022.99	\$69,698.15		
Town of Gretna	\$41,022.80	\$15,579.35	\$819.06	\$3,338.64	\$4,718.91	\$65,478.76		
Town of Hurt	\$41,642.88	\$15,814.84	\$831.44	\$3,389.10	\$4,790.23	\$66,468.49		
Total	\$9,215,390.64	\$3,864,646.38	\$426,320.86	\$1,407,596.80	\$739,826.41	\$15,653,781.09		

Table V-13. Building Stock Exposure by General Occupancy (from HAZUS-MH)										
	Building Stock Exposure By General Occupancy									
Jurisdiction	Residential	Commercial	Industrial	Agri.	Religion	Gov't	Edu.	Total		
Danville City	\$2,605,910.00	\$457,572.00	\$82,232.00	\$1,746.00	\$46,402.00	\$11,634.00	\$14,916.00	\$3,220,412.00		
Franklin County	\$2,415,027.00	\$244,259.00	\$128,937.00	\$10,522.00	\$30,472.00	\$1,373.00	\$9,762.00	\$2,840,352.00		
Town of Boones Mill	\$14,555.74	\$1,472.19	\$777.12	\$63.42	\$183.66	\$8.28	\$58.84	\$17,119.24		
Town of Rocky Mount	\$207,661.88	\$21,003.20	\$11,086.96	\$904.76	\$2,620.21	\$118.06	\$839.41	\$244,234.47		
Henry County	\$2,671,052.00	\$369,504.00	\$330,001.00	\$13,635.00	\$42,070.00	\$3,816.00	\$26,017.00	\$3,456,095.00		
Town of Ridgeway	\$35,733.91	\$4,943.30	\$4,414.82	\$182.41	\$562.82	\$51.05	\$348.06	\$46,236.38		
Martinsville City	\$858,312.00	\$245,892.00	\$46,916.00	\$482.00	\$17,247.00	\$8,597.00	\$3,720.00	\$1,181,166.00		
Patrick County	\$983,138.00	\$72,720.00	\$78,452.00	\$9,477.00	\$23,017.00	\$1,845.00	\$4,872.00	\$1,173,521.00		
Town of Stuart	\$48,683.24	\$3,600.96	\$3,884.80	\$469.28	\$1,139.76	\$91.36	\$241.25	\$58,110.67		
Pittsylvania County	\$2,850,292.00	\$194,027.00	\$73,876.00	\$22,306.00	\$59,324.00	\$1,861.00	\$14,693.00	\$3,216,379.00		
Town of Chatham	\$61,765.17	\$4,204.52	\$1,600.88	\$483.37	\$1,285.54	\$40.33	\$318.39	\$69,698.20		
Town of Gretna	\$58,026.03	\$3,949.99	\$1,503.96	\$454.10	\$1,207.71	\$37.89	\$299.12	\$65,478.80		
Town of Hurt	\$58,903.11	\$4,009.69	\$1,526.69	\$460.97	\$1,225.97	\$38.46	\$303.64	\$66,468.53		
Total	\$12,869,060.08	\$1,627,157.85	\$765,209.24	\$61,186.31	\$226,757.67	\$29,511.42	\$76,388.71	\$15,655,271.29		

All values are in thousands of dollars

Critical Facilities

Vulnerability to critical facilities from hurricane winds is fairly uniform throughout the region. As Figure V-15 showed, there is only slight variation from the eastern to western portions of the region for a probabilistic 50-year wind event. In general, critical facilities in Franklin and Patrick Counties will have slightly higher vulnerability compared to the rest of the region.

Loss Estimation

Table V-14 provides the loss estimations from HAZUS-MH by building type. As noted earlier, wood structures compose the majority of the structures, and also account for the majority of the losses. Table V-15 shows the loss by occupancy type. Note that differences between the totals in the tables are due to rounding in the calculations in HAZUS-MH.

		Building Stock	Loss by Buildin	д Туре		
Jurisdiction	Wood	Masonry	Concrete	Steel	MH	TOTAL
Danville City	\$347.43	\$145.11	\$7.33	\$29.25	\$6.43	\$535.55
Franklin County	\$197.80	\$74.40	\$3.00	\$12.77	\$21.51	\$309.47
Town of Boones Mill	\$1.19	\$0.45	\$0.02	\$0.08	\$0.13	\$1.87
Town of Rocky Mount	\$17.01	\$6.40	\$0.26	\$1.10	\$1.85	\$26.61
Henry County	\$214.66	\$87.25	\$4.16	\$23.38	\$25.67	\$355.11
Town of Ridgeway	\$2.87	\$1.17	\$0.06	\$0.31	\$0.34	\$4.75
Martinsville City	\$80.12	\$41.47	\$3.46	\$13.26	\$0.11	\$138.41
Patrick County	\$63.12	\$25.86	\$1.01	\$4.44	\$10.05	\$104.48
Town of Stuart	\$3.13	\$1.28	\$0.05	\$0.22	\$0.50	\$5.17
Pittsylvania County	\$311.40	\$93.32	\$1.42	\$7.67	\$31.58	\$445.39
Town of Chatham	\$6.75	\$2.02	\$0.03	\$0.17	\$0.68	\$9.65
Town of Gretna	\$6.34	\$1.90	\$0.03	\$0.16	\$0.64	\$9.07
Town of Hurt	\$6.44	\$1.93	\$0.03	\$0.16	\$0.65	\$9.20
Total	\$1,258.25	\$482.55	\$20.85	\$92.96	\$100.15	\$1,954.76

	Table V-	l5. Building Sto	ck Loss by Gei	neral Occupanc	y (from HAZU)	S-IVIH)			
Building Stock Loss By General Occupancy									
Jurisdiction	Residential	Commercial	Industrial	Agriculture	Religion	Gov't	Edu.	Total	
Danville City	\$479.43	\$42.60	\$6.88	\$0.22	\$3.26	\$1.36	\$1.37	\$535.13	
Franklin County	\$280.38	\$13.81	\$12.28	\$0.73	\$1.41	\$0.08	\$0.49	\$309.18	
*Town of Boones Mill	\$1.69	\$0.08	\$0.07	\$0.00	\$0.01	\$0.00	\$0.00	\$1.86	
*Town of Rocky Mount	\$24.11	\$1.19	\$1.06	\$0.06	\$0.12	\$0.01	\$0.04	\$26.59	
Henry County	\$308.13	\$20.53	\$22.97	\$0.91	\$1.94	\$0.26	\$1.51	\$356.25	
*Town of Ridgeway	\$4.12	\$0.27	\$0.31	\$0.01	\$0.03	\$0.00	\$0.02	\$4.77	
Martinsville City	\$111.70	\$19.12	\$5.59	\$0.05	\$1.09	\$0.78	\$0.27	\$138.60	
Patrick County	\$93.59	\$3.34	\$6.06	\$0.58	\$0.89	\$0.09	\$0.20	\$104.75	
*Town of Stuart	\$4.63	\$0.17	\$0.30	\$0.03	\$0.04	\$0.00	\$0.01	\$5.19	
Pittsylvania County	\$426.71	\$9.52	\$3.91	\$1.51	\$2.39	\$0.09	\$0.60	\$444.73	
*Town of Chatham	\$9.25	\$0.21	\$0.08	\$0.03	\$0.05	\$0.00	\$0.01	\$9.64	
*Town of Gretna	\$8.69	\$0.19	\$0.08	\$0.03	\$0.05	\$0.00	\$0.01	\$9.05	
*Town of Hurt	\$8.82	\$0.20	\$0.08	\$0.03	\$0.05	\$0.00	\$0.01	\$9.19	
Total	\$1,761.25	\$111.23	\$59.67	\$4.20	\$11.33	\$2.68	\$4.55	\$1,954.91	

Figure V-13 illustrates the annualized loss due to hurricane winds. Damages were estimated using census blocks where hurricane losses occur, in addition to local comments regarding areas of concern to the community. In Appendix B, the tables summarize the problem spot locations that are denoted in the maps found there.

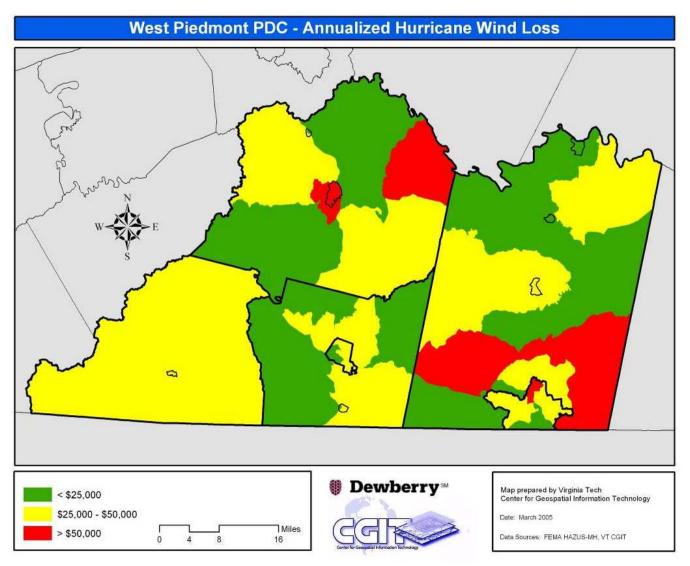


Figure V-13. Total Annualized Hurricane Loss

Tornado (Limited Ranking)

Hazard History

Appendix B includes descriptions of major tornado events that have touched down in the West Piedmont region. Events have been broken down by the date of occurrence and when available, by individual community descriptions. When no community-specific description is available, the general description represents the entire planning area.

Hazard Profile

Damaging winds typically are associated with tornadoes or landfalling hurricanes. Isolated "downburst" or "straight-line" winds associated with any common thunderstorm also can cause extensive property damage.

Tornadoes are classified as a rotating column of wind that extends between a thunderstorm cloud and the earth's surface. Winds are typically less than 100 mph, with severe tornado wind speeds exceeding 250 mph. The rotating column of air often resembles a funnel shaped cloud. The widths of tornados are usually several yards across, with infrequent events being over a mile wide. Tornadoes and their resultant damage can be classified into six categories using the Fujita Scale. This scale assigns numerical values for wind speeds inside the tornado according to the type of damage and degree of the tornado. Most tornadoes are F0 and F1, resulting in little widespread damage. Tornado activity normally spans from April through July but tornados can occur at any time throughout the year. In Virginia, peak tornado activity is in July. Hot, humid conditions stimulate the tornadoes' growth.

Strong tornadoes may be produced by thunderstorms and often are associated with the passage of hurricanes. On average, about seven tornadoes are reported in Virginia each year. The actual number may be higher as incidents may occur over sparsely populated areas, or may not cause any property damage so are not reported or recorded.

Tornado damage is computed using the Fujita Scale, as shown in Table V-16. Classification is based on the amount of damage caused by the tornado, where the measure of magnitude is based on the impact.

Table V	-16. Fujita Tor	nado Intensity S	Scale (From Nation	al Weather Service)
Classification	Max. Winds (mph)	Path Length (mi.)	Path Width (mi)	Damage
F0	less than 73	less than 1.0	less than 0.01	Chimneys damaged, trees broken
F1	73-112	1.0-3.1	0.01-0.03	Mobile homes moved off foundations or overturned
F2	113-157	3.2-9.9	0.03-0.09	Considerable damage, mobile homes demolished, trees uprooted
F3	158-206	31-Oct	0.10-0.29	Roof and walls torn down, trains overturned, cars thrown
F4	207-260	32-99	0.30-0.90	Well-constructed walls leveled
F5	261-318	100-315	1.0-3.1	Homes lifted off foundations and carried some distance, cars thrown as far as 300 ft

The classification of the tornado gives an approximate depiction of what the corresponding tornado damage will be. A majority of Virginia's tornadoes are F0 and F1 on the Fujita Scale, shown in Table V-17. These events result in minimal extensive damage. Damage that is likely to occur would be damage to trees, shrubbery, signs, antennas, with some damage to roofs and unanchored trailers.

	Table V-17. Virginia Tornado Statistics 1950-2001								
Fujita Scale	Class	MPH	Damage Description	# in VA	%	Deaths / Injuries	Damages (\$M)		
FO	Weak	40-72	Light damage. Tree branches snapped; antennas and signs damaged.	99	26	0/0	7		
F1	Moderate	73- 112	Moderate damage. Roofs off; trees snapped; trailers moved or overturned.	186	50	1 / 85	57		

	Table V-17. Virginia Tornado Statistics 1950-2001								
Fujita Scale	Class	МРН	Damage Description	# in VA	%	Deaths / Injuries	Damages (\$M)		
F2	Strong	113- 157	Considerable damage. Weak structures and trailers demolished; cars blown off road.	66	18	3 / 72	75		
F3	Severe	158- 206	Roofs and some walls torn off well constructed buildings; some rural buildings demolished; cars lifted and tumbled.	23	6	19 / 102	140		
F4	Devastatin g	207- 260	Houses leveled leaving piles of debris; cars thrown some distance.	2	0.1	4 / 248	50		
F5	Incredible	261- 318	Well built houses lifted off foundation and disintegrated with debris carried some distance.	0	0	N/A	N/A		

Table V-18 and Figure V-14 show tornado occurrences in the West Piedmont Region. Tornadoes are not infrequent in this region, as illustrated by the numerous tornado events of 2004. However, probable instances of tornado probable damage, though more limited in area, are likely covered by the damage estimates in Hurricane Wind analysis cover.

Table V-18. Tornado Statistics by Fujita Intensity Scale (1950-2004)									
West Pied	West Piedmont Region Tornado Touchdowns								
Jurisdiction F0 F1 F2 F3 Total									
City of Danville	1	1	0	0	2				
Franklin County	2	0	1	0	3				
Henry County	0	2	3	0	5				
Patrick County	0	2	0	0	2				
Pittsylvania County	Pittsylvania County 2 7 2 0 11								
Total	3	12	6	0	23				

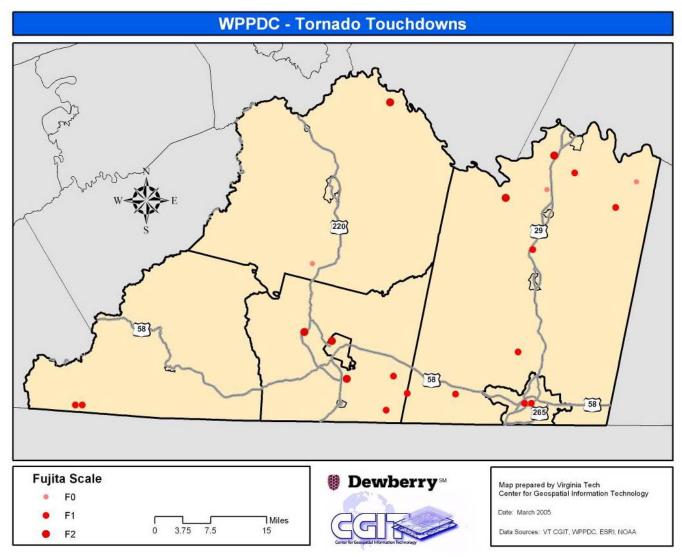


Figure V-14. West Piedmont Region Tornado Touchdowns (1950-2004).

Drought (Limited Ranking)

Hazard History

Appendix B includes descriptions of major droughts that have occurred in the West Piedmont region. Events have been categorized by occurrence dates and when available, by individual community descriptions. When no community-specific description is available, the general description represents the entire planning area.

Hazard Profile

A drought can be characterized in several different ways depending on the impact. The most common drought form is agricultural. Agricultural droughts are characterized by unusually dry conditions during the growing season. Meteorological drought is an extended period of time (6 or more months) with precipitation less than 75 percent of the normal precipitation. Severity of droughts often depends on the community reliance on a specific water source. The probability of a drought is difficult to predict given the number of variables involved. As shown by in the table below, drought conditions make an appearance at least once a decade.

Many problems can arise at the onset of a drought, some of which include diminished water supplies and quality, undernourished livestock and wildlife, crop damage, and possible wildfires. Secondary impacts from droughts pose problems to farmers who incur reductions in income, while food prices and lumber prices can drastically increase.

The impact of excessive heat is most prevalent in urban areas, where urban heat island effects prevent inner-city building from releasing heat built up during the daylight hours. Secondary impacts of excessive heat are severe strain on the electrical power system and potential brownouts or blackouts.

Table V-19 provides a summary of drought categories and impacts. As the drought severity increases, it should be noted that voluntary initial water restrictions are changed to mandatory restrictions. For excessive heat, the National Weather Service utilizes heat index thresholds as criteria for the issuance of heat advisories and excessive heat warnings.

	Table V-19. Drought Severity Classification						
Category	Description	Possible Impacts					
		Going into drought: short-term dryness slowing					
D0	Abnormally Dry	planting, growth of crops or pastures; fire risk above					
D0	Abnormally Dry	average. Coming out of drought: some lingering water					
		deficits; pastures or crops not fully recovered.					
		Some damage to crops, pastures; fire risk high;					
D1	Madausta Duarraha	streams, reservoirs, or wells low, some water sh					
	Moderate Drought	developing or imminent, voluntary water use					
		restrictions requested					
D2	Corrore Drawaht	Crop or pasture losses likely; fire risk very high; water					
D2	Severe Drought	shortages common; water restrictions imposed					
D2	E-to	Major crop/pasture losses; extreme fire danger;					
D3	Extreme Drought	widespread water shortages or restrictions					

Vulnerability Analysis

The 1990 Census contained detailed information about water source per census block group. For purposes of this analysis, it was assumed that areas with populations having less than 25% of public/private water systems had a high vulnerability ranking. When a drought occurs, these areas would likely feel a larger impact since most homes receive their water from wells, which may dry up during a drought. Table V-20 provides a summary of the 1990 population in three categories of drought vulnerability. Figure V-15 shows each of the designated categories for each of the counties. The parts of the planning areas that are more susceptible to droughts are the areas outside of town and city limits.

Table V-20. West Piedmont Region Population Drought Risk (from 1990 Census)								
% Population with Public/Private Water Systems	< 25%	25% - 50%	> 50%	Total				
Franklin County	29,073	1,631	8,845	39,549				
Henry County	21,564	2,420	32,958	56,942				
Patrick County	16,028	0	1,445	17,473				
Pittsylvania County	45,109	3,593	6,953	55,655				
Danville City	0	0	53,056	53,056				
Martinsville City	0	0	16,162	16,162				
Total	111,774	7,644	119,419	238,837				

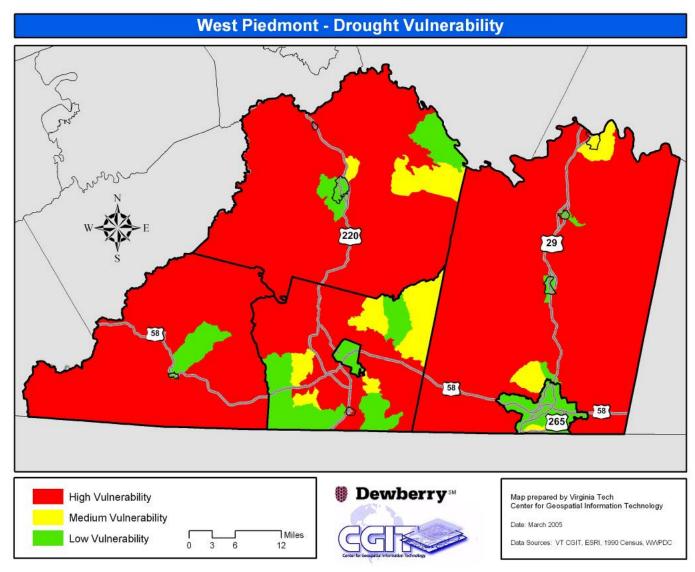


Figure V-15. West Piedmont Region Drought Vulnerability

Wildfire (Limited Ranking)

Hazard History

The Virginia Department of Forestry (VDOF) website provided fire incidence data for fire years 1995-2001. The data provided by VDOF was summarized into the following tables.

Table V-21 provides information on the number of wildfire per county. Table V-22 is a summary of the number of acres and total damages of wildfires in the West Piedmont area. There were no wildfires indicated for any of the cities in the West Piedmont region. Table V-23 illustrates the cause of fire, broken down by county. The data shows that 35% of fires were caused by debris, followed by 19% caused by incendiary devices and 16% caused under miscellaneous conditions.

Table `	Table V-21. Wildfire Statistics by Fire Year 1995-2001 (from VDOF)										
	Number of Wildfires by Fire Year (1995-2001)										
County	County 1995 1996 1997 1998 1999 2000 2001 Total										
Franklin	35	15	24	25	36	15	50	200			
Henry	23	22	15	20	20	6	41	147			
Patrick	13	7	0	9	11	8	24	72			
Pittsylvania	Pittsylvania 34 14 21 21 38 12 55 195										
Total	105	58	60	75	105	41	170	614			

Pittsylvania County officials noted that Smith Mountain and Jasper Mountain have been the sites of past wildfires.

Table V-22. Wildfire Summary 1995-2001 (from VDOF)									
Fire Year	1995		1996		1997		1998		
County	Total Acres	Total Damage	Total Acres	Total Damage	Total Acres	Total Damage	Total Acres	Total Damage	
Franklin	138.6	\$209,425	30.1	\$14,175	76.7	\$5,000	49.5	\$15,071	
Henry	53	\$26,150	32.1	\$9,450	55	\$28,000	63.7	\$18,300	
Patrick	150	\$30,780	14.3	\$375	0	\$0	14.1	\$100	
Pittsylvania	81	\$13,465	48.8	\$2,215	63.9	\$13,260	46.9	\$52,025	
Total	422.6	\$279,820	125.3	\$26,215	195.6	\$46,260	174.2	\$85,496	
Fire Year	1	.999	20	000	2001		Acres	Damages	
C	Total	Total	Total	Total	Total	Total	Total	Total	
County	Acres	Damage	Acres	Damage	Acres	Damage			
Franklin	125	\$3,500	68.3	\$2,000	229	\$22,250	717.2	\$271,421	
Henry	74.1	\$28,650	91.3	\$4,500	173.8	\$41,550	543	\$156,600	
Patrick	129.5	\$104,800	26.6	\$0	88.6	\$41,700	423.1	\$177,755	
Pittsylvania	555.4	\$164,300	49.8	\$8,603	348.4	\$196,005	1,194.20	\$449,873	
Total	884	\$301,250	236	\$15,103	839.8	\$301,505	2,877.50	\$1,055,649	

Table V-23. Wildfire Causes 1995-2001 (from VDOF)										
County	Lightening	Camp Fire	Smoking	Debris	Incendiary	Equip. Use	R&R	Children	Misc.	Total
Franklin	3	0	4	66	36	25	0	19	47	200
Henry	0	0	14	51	41	8	3	15	15	147
Patrick	6	0	2	24	13	5	0	3	19	72
Pittsylvania	Ivania 9 1 22 78 28 15 7 16 19 195									
Total	18	1	42	219	118	53	10	53	100	614

Hazard Profile

Wildfire is a unique hazard in that it can be significantly altered based on efforts to control its course during the event. According to VDOF, there are three principle factors that can lead to the formation of wildfire hazards: topography, fuel, and weather. Wildfires in Virginia mostly occur in the spring (March and April) and fall (October and November). The environmental conditions that exist during these seasons exacerbate the hazard. When low relative humidity and high winds are

coupled with a dry forest floor (e.g., brush, grasses, leaf litter), wildfires may easily ignite. Years of drought can lead to environmental conditions that promote wildfires. Accidental or intentional setting of fires by humans is the largest contributor to wildfires. Residential areas or "woodland communities" that expand into wildland areas also increase the risk of wildfire.

Secondary Effects

Secondary effects from wildfires can pose a significant threat to the communities surrounding the hazard. During a wildfire, the removal of groundcover that serves to stabilize soil can lead to secondary hazards such as landslides, mudslides, and flooding. In addition, the leftover scorched and barren land may take years to recover; the resulting erosion can be problematic.

Hazard Areas

Figure V-16 shows the wildfire hazard map developed by VDOF. In 2002 and 2003, VDOF examined which factors influence the occurrence and advancement of wildfires and how these factors could be represented in a GIS model. VDOF determined that historical fire incidents, land cover (fuels surrogate), topographic characteristics, population density, and distance to roads were critical variables in a wildfire risk analysis. The resulting high, medium, and low risk category reflect the results of this analysis.

Vulnerability Analysis

VDOF defines "woodland home communities as "clusters of homes located along forested areas at the wildland-urban interface that could possibly be damaged during a nearby wildfire incident." Tables 24 and 25 illustrate the number of woodland communities and the number of homes in these woodland communities, as designated by Virginia Department of Forestry. In the West Piedmont region, 74% of the woodland homes are considered to have high potential for a wildfire, while 78% of woodland communities in the planning area are considered at high risk for wildfire.

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⁸Virginia Department of Forestry. *Virginia Woodland Homes Communities*. Retrieved from http://www.dof.virginia.gov/gis/dwnld-whc-faq.shtml on May 2, 2005.

Table V-24. Woodland Communities Wildfire Risk.										
Num	Number of Woodland Communities by Fire Rank									
Low Medium High Grand % High County Potential Potential Potential Total Risk										
Franklin	0	1	37	38	97%					
Непту	2	1	27	30	90%					
Patrick	0	6	19	25	76%					
Pittsylvania 6 14 26 46 57%										
Grand Total	8	22	109	139	78%					

Table V-25. Woodland Homes Wildfire Risk										
N	Number of Woodland Homes by Fire Rank									
Low Medium High Grand % High County Potential Potential Total Risk										
Franklin	0	10	643	653	98%					
Henry	36	12	1,363	1,411	97%					
Patrick	0	92	255	347	73%					
Pittsylvania	Pittsylvania 445 435 698 1,578 44%									
Grand Total	481	549	2,959	3,989	74%					

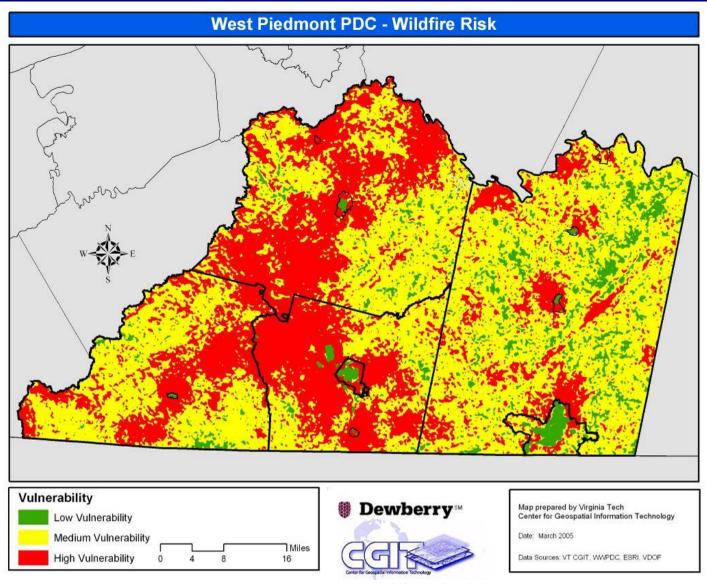


Figure V-16. West Piedmont Region Wildfire Vulnerability

Structures at Risk

Table V-26 shows the percentages of critical facilities in fire risk zones. Approximately 15% are located in a high risk area. Figure V-20 shows the locations of critical facilities in relation to fire risk zones.

Table V-26. West Piedmont Region Critical Facilities Wildfire Vulnerability										
	Number of Critical Facilities by Fire Rank									
JurisdictionLow PotentialMedium PotentialHigh PotentialGrand Potential% High Risk										
Danville City	56	24	3	83	4%					
Franklin County	22	38	22	82	27%					
Henry County	7	21	22	50	44%					
Martinsville City	9	6	0	15	0%					
Patrick County	5	12	8	25	32%					
Pittsylvania										
County	83	230	34	347	10%					
Total	182	331	89	602	15%					

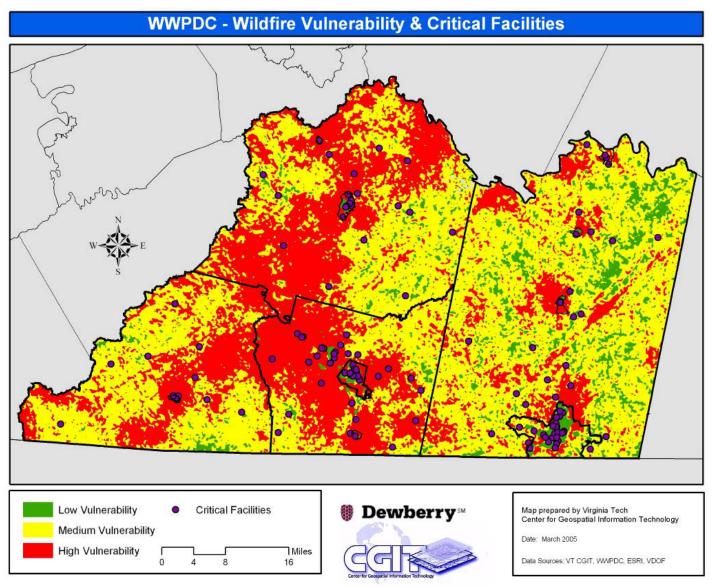


Figure V-17. West Piedmont Region Wildfire Vulnerability and Critical Facilities

Human-Caused Hazard Events

The following sections address the impacts of human-caused hazards on the West Piedmont Planning District Commission. Human-caused hazards were included at the request of the communities in the West Piedmont Planning District Commission; these hazards are not required by VDEM or FEMA for the approval of the West Piedmont Regional Hazard Mitigation Plan.

The FEMA risk management series on mitigating potential terrorist attacks against buildings provides information on developing a realistic prioritization of human-caused hazards. The mitigation strategies section on this report should provide projects to address human caused hazard vulnerability. Future analysis steps to consider include:

- Determine the relative importance of various critical and non-critical facilities and the asset of these systems
- Determine the vulnerability of each facility to a specified hazard
- Determine what human threats are known to exist in the communities

Each section provides a brief overview of the hazard, potential impacts and a general community vulnerability analysis, when applicable. Vulnerability analyses were completed for dams and agriterrorism. Ideally, for the other events, analyses should be included and fully addressed in each community Emergency Operation Plans (EOP).

From the EOPs provided (Table V-27), it appears that the communities in the planning area are beginning to address these concerns. At this time, limited data are available for the region. Due to the limited data available for the region and concerns about security and community data confidentiality, the locations of pipelines, high voltage transmission lines (HVT) or potential inorganic/organic spills are not included in this HIRA.

Table V-27. West Piedmont Community EOPs and Data Provided for Analysis											
Jurisdiction	EOP provided to Dewberry Team	HazMat Data provided to Dewberry Team	Pipeline Data provided to Dewberry Team								
Danville City											
Franklin County	X										
Henry County	X		X								
Martinsville City											
Patrick County	X										
Pittsylvania County	X	X	X								

Dams (Significant Ranking)

Hazard Profile

Even in the era before severe terrorism concerns, dams in the United States faced the potential of failure. Dams can fail in numerous ways. Overtopping, one of the most common causes of dam failure, occurs when the dam's spillway is inadequate for dealing with excess water. During flood events, too much water to be properly handled by the spillway may rush to the dam site, and flow over the top of the dam.

Improper building construction, including using easily eroded construction materials, also frequently leads to the slow structural failure of dams. This failure can be compounded by underlying geological factors such as porous bedrock that loses structural integrity when saturated. Landslides pose two threats to dams, both upstream from the dam and at the dam site itself. At the dam site, a landslide could completely wipe out the dam from its foundation. A landslide upstream has the potential to send a wave of water surging towards the dam, quite possibly causing an overtopping event. Earthquakes also are a major threat to dams, though it is very rare that a dam will be completely destroyed by an earthquake. In the event of total failure, the most common cause is the liquefaction of fill along the dam wall

Following the terrorist attacks of September 11, 2001, concerns for dam safety from terrorist attack came to the forefront. Dams are considered by the Department of Homeland Security (DHS) to be one of the five key national assets, and are considered critical infrastructure. Their significance places them at high risk for terrorist attack. The federal government has developed the National Strategy for the Physical

Protection of Critical Infrastructures and Key Assets, which determines how vulnerable dams are and how they can be protected. A major factor in protecting the dams of the United States is that the federal government only has access and control over 5% of the dams whose failure could result in loss of life or significant property damage.

FEMA and the DHS have been continuing efforts to increase security at dam sites and set up emergency management plans to deal with the aftermath of a potential terrorist attack on a critical dam.

No matter what the cause of dam failure, the aftermath of such an event can range from moderate to severe. It is likely that the failure of major dams will cause widespread loss of life downstream to humans and animals, as well as extreme environmental stress along the flood path. Water supplies upstream could be left completely dry, while water supplies downstream are overrun or contaminated with debris from the ensuing flood.

Dams are constructed to serve a number of purposes including recreation, irrigation, flood control, navigation and to provide drinking water and electricity. The most common purpose for the construction of a dam in the United States is the creation of a reliable and efficient power source. Dams produce electricity by using flowing or falling water from the reservoir behind the dam to spin the blades of turbines. The spinning turbines activate generators, which produce the electricity. Hydroelectric power is the nation's largest renewable energy source. The International Energy Agency estimates, however, that while hydroelectric power accounted for 11.5% of the energy produced in the United States, it declined to 7.7% in 1998.

Although the primary purpose of most dams constructed in the United States is to provide hydroelectric power, a majority of dams built in the Mid-Atlantic region are designed to alleviate flooding or to provide recreation (Table V-33). During heavy rains or snowmelt, dams used for flood control allow excessive water upstream of the dam to collect slowly in the reservoir. The water can then be gradually released from the dam into the river downstream, preventing flooding. Sometimes the water can be stored in the reservoir until a drier period occurs. In this way, flood control dams are used to maintain a relatively steady flow rate in a river or stream.

Dams also can be used as a community water supply. Most dams in Virginia provide a recreational venue for thousands of people, even if their construction purpose was not recreational. The reservoirs created by dams are, in many cases, used for fishing and often local agencies stock the water several times a year. Reservoirs of ample size also provide boating opportunities for many people. Common boating activities include

water skiing, jet skiing, tubing, and leisure outings. Recreational reservoirs also provide commercial opportunities near the water, including sporting and boating outfitters, local marinas and lodging. Also, property near reservoirs often sells at higher rates than those in surrounding areas, providing additional revenue for local taxing entities.

Vulnerability Analysis

The National Inventory of Dams provides information about individual dams. Tables V-29 through V-33 summarize this information for the dams in the West Piedmont region. Figure V-18 illustrates the locations and hazard potential of dams in the West Piedmont region. The following tables and summaries will provide a further breakdown of the dam capacities, regulations, hazard potential and purposes.

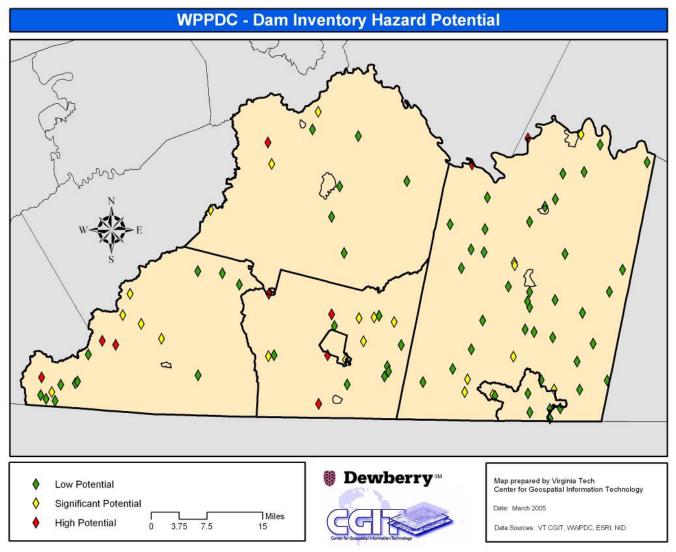


Figure V-18. West Piedmont Region Dam Locations and Failure Potential

Table V-28 denotes the classification that Virginia Department of Conservation and Recreation (DCR) uses to regulate dams in the Commonwealth. Sixty percent of the dams in the planning area are not regulated by the state. The likelihood of dam failure is low but it does pose a large potential threat to areas with large populations surrounding dams. Table V-29 denotes the number of dams that are regulated in each of the communities under the National Dam Safety Program Act. On-going dam inspections and Virginia's participation in the National Dam Safety Program maintained by FEMA and the U.S. Army Corps of Engineers serve as preventative measures against dam failures.

The dam inventory provides information on the downstream hazard potential of a dam failure. Table V-30 lists the number of dams in each of the classes by community. The dam inventory divides the hazard potential into three categories: low, high and significant. The classification is based on two main criteria 1) Loss of Human Life and 2) Economic, Environmental, Lifeline Losses. Dams are classified as low potential when there is a low potential for failure or mis-operation resulting in no probable human loss or economic and environmental losses. High potential areas are categorized by dam failure that could result in the loss of human life. Significant potential for dam failure is characterized by the likely loss of human life or excessive economic losses.

Most of the dams in the region are rated as low (66%) hazard potential. The remaining dams in the planning area are classified as having either a High (10%) or Significant (24%) impact if failure were to occur. With respect to individual communities, Henry and Patrick Counties have the highest number of dams in the High risk categories (7%). It is important to note that the areas potentially affected if these dams were to fail are not restricted to these counties.

Table V-31 provides summary characteristics about the surface area and maximum storage area of the dams in each of the communities. Surface area, explained by the national inventory of dams, describes the surface area for a given dam as the surface area of the impoundment at its normal retention level. Surface area in the following table, given in acres, indicates the average surface area of all of the dams in the community and as a sum of the surface area for the community. Maximum storage, explained by the national inventory of dams, is described as the total storage space in a reservoir below the maximum attainable water surface elevation including any surcharge storage. Maximum storage in the following table, given in acre-feet, indicates the average maximum storage of all of the dams in the community and as a sum of the maximum storage for the community.

The dams in the West Piedmont region, summarized by Table V-33, are used for many different purposes. Table V-32 includes the class signifiers that describe the dams' uses. Dams with multiple codes have been concatenated and primary use should be interpreted in the order of the code; with relative decreasing importance of the dam purpose. Recreation is the primary use for forty-two percent of the dams in the region, followed by eighteen percent used for flood control and storm water management, and ten percent for recreation and irrigation.

	Table V-28. Regulated Dam Classes										
Class	Description	Inspection Period									
Class I	Dams which upon failure would cause probable loss of life or excessive economic loss	Inspected every two years.									
Class II	Dams which upon failure could cause possible loss of life or appreciable economic loss	Inspected every three years.									
Class III	Dams which upon failure would not likely lead to loss of life or significant economic loss	Inspected every six years, upon renewal of the certificate.									
Class IV	Dams which upon failure would not likely lead to loss of life or economic loss to others	Inspection not applicable for Class IV.									

Table V-29. Regulated Dam Classes By Jurisdiction									
Jurisdiction	State Regulated	Total							
Danville City	5	1	6						
Franklin County	7	3	10						
Henry County	2	16	18						
Martinsville City	0	2	2						
Patrick County	9	10	19						
Pittsylvania County	40	10	50						
Total	63	42	105						

Table V-30. Hazard Potential											
Jurisdiction	Low	Significant	High	Total							
Danville City	3	3	0	6							
Franklin County	6	3	1	10							
Henry County	8	6	4	18							
Martinsville City	1	0	1	2							
Patrick County	11	5	3	19							
Pittsylvania County	40	8	2	50							
Total	69	25	11	105							

Table V-31. Community Dam Storage Capacity and Surface Area										
			Average Maximum							
	Average Surface	Total Surface	Storage (acre-	Total Maximum						
Jurisdiction	Area (acres)	Area (acres)	feet)	Storage (acre-feet)						
Danville City	2	11	204	1,224						
Franklin County	3	30	170	1,699						
Henry County	186	3,355	18,942	340,955						
Martinsville City	91	183	3,377	6,753						
Patrick County	22	416	220	4,183						
Pittsylvania County	23,879	24,290	360	17,259						
Total	24,183	28,285	23,273	372,073						

	Table V-32. Codes for Reservoir Purpose (NDI)
Code	Description Use
С	Flood Control and Storm Water Management
D	Debris Control
F	Fish and Wildlife Pond
Н	Hydroelectric
I	Irrigation
N	Navigation
О	Other
P	Fire Protection, Stock, Or Small Farm Pond
R	Recreation
S	Water Supply
Т	Tailings

	Table V-33. Dam Uses (NDI)																
Jurisdiction	С	CR	Н	HR	HRSFO	Ι	IP	IR	0	P	R	RI	RP	S	SO	SR	Total
Danville City	0	0	0	1	0	1	0	1	0	0	3	0	0	0	0	0	6
Franklin County	2	0	0	0	0	0	0	0	1	0	6	0	1	0	0	0	10
Henry County	9	0	1	0	1	0	0	1	0	0	4	0	0	1	0	1	18
Martinsville City	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	2
Patrick County	7	0	2	0	0	0	1	0	0	0	8	0	1	0	0	0	19
Pittsylvania	0	2	2	1	0	7	0	1	1	2	21	10	0	2	1	0	50
County	U	2		1	U	/	U	1	1		Z I	10	U		1	U	30
Total	19	2	5	2	1	8	1	3	2	2	42	10	2	4	1	1	105

The City of Danville has conducted a study regarding removal of the dam on the Danville River and the potential impacts its removal could have on the flood hazard. No action has been determined from these studies.

The Marrowbone Dam in Henry County is undergoing a rehabilitiation project begun in June 2005. The Dam is classified as a "High" hazard. Homes, businesses and infrastructure would sustain an estimated \$2 million in damage from floodwater. According to data from the NRCS, the environmental impact of a dam failure would include the release of 32.8 acres of nutrient-laden deep water and loss of five acres of wetland. More than eight miles of Marrowbone Creek and adjacent flood plain would be damaged.⁹

HVT Lines (Moderate Ranking)

Hazard Profile

High voltage transmission (HVT) lines are the backbone of the world's electrical system. They are usually constructed in straight lines, to minimize the cost of building very large steel towers. The towers are very sturdy and it is very rare for these structures to become damaged, except for cases of extreme natural phenomena such as lightening strikes, hurricanes, tornadoes, and earthquakes.

High voltage transmission lines are used to distribute power from the generation plant to the different localities using the power source. Power grid failure is largely weather-related, with some occasions of human-related failures. Examples of human-related failures range from human error in controlling and maintaining the system to direct acts of sabotage on the system.

A much larger problem is the vulnerability of the national grid system formed by the high voltage transmission lines. Power from different sources is linked together in a grid system to allow for the rerouting of unused power from far away sources if a local power supplier fails. This setup is very efficient economically. However, history has shown this grid system to be vulnerable to failure in rare circumstances.

HVT lines can be impacted by local or widespread disruption in the power grid service. Disruption can take the form of intentional destruction of the utility poles to automobile accidents taking down service poles. The immediate area surrounding the pole or downed lines should be concerned dangerous as long as the lines remain alive. Most HVT lines are located in dedicated right of ways, which have no inhabited

⁹ Martinsville Bulletin. Marrowbone Dam rehab starts. June 22, 2005.

structures within them. Sparks from the downed power lines have the potential to start fires.

Without a power supply, many daily living functions would be impacted. These secondary impacts can be compounded with prolonged failure. Impacts include, but are not limited to, loss of heating and cooling, refrigeration, lack of running water, malfunction or cessation of critical facilities and computer infrastructures. Power grid failure has a potential to negatively impact large numbers of people. The extent of this type of event is not predictable.

In November of 1965, an automatic current flow regulating device in Ontario, Canada failed, allowing a circuit breaker to remain open. This failure allowed the current flow into the northeastern United States to increase rapidly. The northern parts of the Northeast grid responded by shutting down and cutting off local generators to protect them. However, since there was now a power vacuum in the Northeast grid, the southern plants automatically tried to fill the void, but doing so caused them to overload. The result was a blackout in the Northeast that covered 80,000 square miles.

The system still remains open to these types of vulnerabilities, as was witnessed by the blackout that occurred on August 14, 2003. This blackout spread from Detroit to New York City to New England, leaving 50 million people without power.

Vulnerability Analysis

A vulnerability analysis was not completed for HVT lines in the planning area because of a lack of available data to fully assess the hazard. FEMA has established general methods for human caused hazards but does not have an established methodology for addressing the vulnerability of HVT lines.

As with any hazard analysis, general methods to determine vulnerability would be to identify where the hazard would occur and what the impacts on specific assets would be. For HVT lines, concerns would focus on a line break causing power outages in the communities that are supplied by that source. Secondary impacts would be the main concern associated with the failure of high voltage transmission lines. Part of the vulnerability analysis would be to identify where the lines are present, what areas are served by the lines and the extent and impact (e.g., loss of work time, loss of food, and effect on human health) of the expected outage.

A strategy to improve available data should be considered for inclusion in the Mitigation Strategy section of this plan.

Organic/Inorganic Spills (Moderate Ranking)

Hazard Profile

Hazardous materials can include explosive, flammable, combustible, corrosive, oxidizing, toxic, infectious, and radioactive materials that are involved in an accidental or intentional release causing danger to the general public. However, a spill can still be deemed hazardous if benign materials such as beverages or non-toxic materials cause a hazard to those in the immediate area. Hazardous material events also can be caused by natural hazards such as earthquakes and floods.

A hazard material spill or release may come from either fixed facilities or mobile containers. The duration of the event can last for hours or even days. Chemicals may be corrosive or otherwise damaging over time. Explosion and/or fire may be subsequent. In addition, contamination may be carried out of the incident area by persons, vehicles, water, and wind.

The magnitude of a hazardous material event is directly related to the amount of materials released, and the speed and efficiency of which emergency and clean up crews respond. Another important factor is what form the spill is in. Solid state spills are typically the easiest to clean up and control, followed by liquid and gaseous state spills. Liquid state spills require rapid response if they are to be contained, and if they infiltrate a watershed, steps must be taken to monitor the influence down stream. Gaseous state spills are almost impossible to contain, and depending on the volume, usually require evacuations down wind.

According to the United States Department of Transportation, highway incidents were responsible for 87% of the total United States hazardous material spills over the last 10 years. Damages from highway incidents alone accounted for \$365,677,814 over that period of time.

The United States Environmental Protection Agency tracks toxic chemical and other waste management activities for certain industries and federal facilities. Specific toxic release data is available for the West Piedmont communities at http://www.epa.gov/triexplorer/. This information can provide an idea of what types of chemicals are present in the community.

Vulnerability Analysis

A detailed vulnerability analysis was not done for organic/inorganic spills in the planning area as a result of the lack of data available to fully assess the hazard. Appendix B lists the various types of spills, reported to the National Response Center (NRC), that have impacted the region from 1990 through 2005 for a total of 272 incidents. The table provides information on the location of the spill, date, type of incident, what was impacted, who was responsible for the incident and the type of chemicals involved. A majority of the spills have involved automotive gasoline, hydraulic and diesel oil. Table V-34 shows the type of incident by jurisdiction.

Table V-34. Organic/Inorganic Spills by Jurisdiction and Type of Spill (1990-2005) (N

Jurisdiction	Air- craft	Contin- uous	Fixed	Mobile	Pipe- line	Rail- road	Railroad non- release	Storage tank	Unknown sheen	Vess -el	Grand Total
Danville	0	2	11	1	1	4	0	0	0	0	19
Franklin	2	1	20	9	1	6	1	1	7	2	50
Henry	0	2	48	21	4	14	2	3	10	1	103
<i>Martins- ville</i>	0	0	3	2	0	0	0	1	0	0	6
Patrick	0	0	4	3	0	0	0	2	1	0	10
Pittsyl- vania	1	1	45	7	4	10	1	3	10	0	82
Grand Total	3	6	131	43	10	34	4	10	28	3	272

FEMA has established general methods for human caused hazards but does not have an established methodology for addressing community vulnerability due to organic/inorganic spills. As with any analysis, general methods to determine vulnerability would be to identify where the hazard could occur and what the impacts on specific assets would be. For organic/inorganic spills, general methods to determine vulnerability would be to determine what facilities use or produce hazardous materials and which high traffic roads and railroads are used to transport organic and inorganic materials in and out of the communities. After the potential contaminants have been identified, the extent, impact and effects of the contaminant can be determined.

Individuals can obtain information on facilities that may affect their home, workplace or other specific locations from the U.S. Environmental Protection Agency by visiting http://yosemite.epa.gov/oswer/ceppoweb.nsf/frmVZIS?OpenForm.

A strategy to improve available data should be considered for inclusion in the Mitigation Strategy section of this plan.

Pipelines (Moderate Ranking)

Hazard Profile

Pipelines are used primarily to transport natural gas and petroleum, though pipelines may carry other hazardous materials. The material in pipelines can be emitted very quickly, and in large quantities if the pipeline is ruptured. In these situations, the materials may continue to accumulate until the flow is turned off by a valve or at a nearby pumping station. A human-caused pipeline failure can come from improvised explosive devices or arson/incendiary attack. Explosive devices can originate from an individual person, a vehicle, or a projectile. The explosion is typically instantaneous, with secondary fall-out from spilled hazardous material in the immediate areas (see organic/inorganic spills for potential impacts) and loss of service to those dependent on the pipeline infrastructure.

Natural gas production in Virginia occurs in the southwestern portion of the state (Figure V-22), and accounts for about one-third of 1 percent of the United States gas consumption in 2000. Petroleum production also takes place in southwestern Virginia (Figure V-23), in Lee and Wise Counties.

The majority of Virginia's natural gas is supplied from a network of interstate pipelines that connect the nation's major gas producing areas, including Louisiana, Texas, and the Gulf of Mexico, to northeastern population centers such as New York, Boston, and Washington DC. Because Virginia is located along these pipeline routes, large quantities of gas move through the state. Ships and barges, railroads, pipelines, and trucks are all essential components of the petroleum-product transportation network. Figure V-19 shows the general location of natural gas pipelines in Virginia.

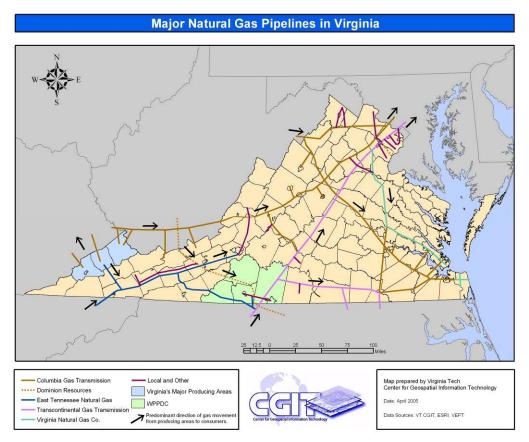


Figure V-19. Major Natural Gas Pipelines in Virginia¹⁰

A petroleum-product pipeline network serves Virginia and the rest of the nation. Pipelines are the primary means for transporting refined petroleum products over long distances. Petroleum products are shipped through these pipelines to product terminals located throughout the state. Trucks are a common means of transporting products from these terminals to individual distribution points, such as gasoline service stations and fuel oil distributors. Figure V-20 shows the general location of petroleum pipelines in Virginia.

¹⁰ Virginia Department of Mines, Minerals, and Energy. *Major Natural Gas Pipelines* • Retrieved from http://www.energy.vt.edu/vept/naturalgas/NG pipelines.asp on April 12, 2005.

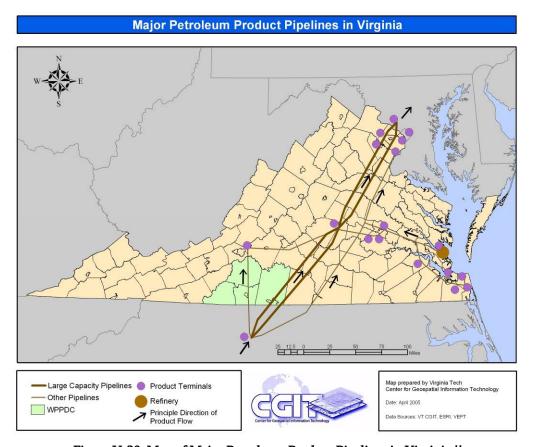


Figure V-20. Map of Major Petroleum Product Pipelines in Virginia 11

The two main causes of pipeline rupture are puncture and corrosion. Pipelines that run through populated areas use pipes with a greater wall thickness to provide an even higher level of protection. To block corrosion, the pipe is coated with special materials. The welds that join pieces of pipe into a single long line are wrapped with a special protective material before the pipeline is placed in the ground. Since ordinary water and hydrocarbons can cause rapid corrosion, those materials are removed from the natural gas at processing plants where appropriate. Pipelines also are made more resistant to corrosion by cathodic protection. A small electrical current is run around buried pipe in the system to reduce the corrosive effects of the soil. This kind of protection is required by the U.S. Department of Transportation.

If a pipeline ruptures, fires may ignite and should not be put out until official personnel shut off pipeline flow from the nearest pump station. Ruptures can cause

¹¹ Virginia Department of Mines, Minerals, and Energy. *Map of Major Petroleum Product Pipelines*. Retrieved from http://www.energy.vt.edu/vept/petroleum/oil-pipeline.asp on April 12, 2005.

large spills or toxic plumes that may have adverse effects on the surrounding environment. The magnitude is quantified by the geographic extent, type of material, and concentration of the plume or spill.

Vulnerability Analysis

Information on the exact location of pipelines is restricted to local, state and federal officials and pipeline operators. Information on how to access this information can be found at on the US Department of Transportation's *National Pipeline Mapping System* website at http://www.npms.rspa.dot.gov/data/data_template.htm.

FEMA has established general methods for human caused hazards but does not have an established methodology for addressing the vulnerability of pipelines. As with any analysis, general methods to determine vulnerability would be to identify where the hazard would occur and what the impacts on specific assets would be. General methods to determine vulnerability to pipelines would be to determine where the major pipelines run through the communities and what they are carrying. With identifying where the pipelines are present, the areas are served and the extent and impact of the expected rupture should be identified.

A strategy to improve available data should be considered for inclusion in the Mitigation Strategy section of this plan.

Agriterrorism (Limited Ranking)

Hazard Profile

Agriterrorism is the use of plant or animal pathogens to cause disruption and disease to the agricultural industry. This anthropogenic hazard can be applied through direct, and generally covert contamination of food supplies, or introduction of pests and/or disease agents to crop and livestock. Durations of agriterrorism can last anywhere from days to months. Agricultural terrorism is a concern because there is a low physical risk to the perpetrator, and there is limited backlash because many attacks have great similarity to natural outbreaks. There are at least 22 agents that can be used for agriterrorism of which many are not vaccinated against. Once an agent has been introduced into the environment, it can remain there for an extended period of time.

The extent of effects varies by type of incident. Food contamination events may be limited to discrete distribution sites, whereas pests and diseases may be spread widely. Generally, there are no effects on the built environment. Inadequate security can facilitate adulteration of food and introduction of pests and disease agents to crops and

livestock. Biochemical or biological agents are organisms or toxins that can be targeted to infect people, livestock and crops. It is difficult to detect a biochemical event and the effects are usually not immediately realized. Biological agents, depending on the organism type and mode of dispersal, can have minimal to fatal implications. Depending on the biological agent, impacts may spread to and among different populations.

The use of livestock antibiotic and steroid programs in the US has created a high vulnerability to diseases. Agriterrorism on animals poses a significant threat because an agent could be introduced easily via these programs and could spread rapidly among the livestock population. The main cattle diseases would be foot and mouth disease and mad cow disease. Transmission can occur as a result of airborne aerosols, direct and indirect contact, and injection of infected food. Avian diseases include Newcastle disease and avian influenza. Both avian diseases are present world-wide. Transmission can occur through direct contact and airborne aerosols.

In addition, commercial plant hybrids have increased the crop susceptibility to many pathogens. Destruction to crops would be more difficult to obtain because of time it would take to spread to other crops and the dependence agriculture has on the weather. The primary concern related to crops is that they do not have resistance to foreign strains and the resistance of certain strains to fungicides. Fungus and bacteria can have detrimental affects on crops. Crops that are primarily impacted by these include cereals (e.g., wheat. barley, rye), corn, rice and potatoes. Airborne spores and waterborne cells are the two primary modes for transmission.

The Office International des Epizooties (OIE) or World Organization for Animal Health is the international body that is responsible for setting animal health standards. The OIE has designated two lists for disease to animals. From the two lists it has been determined that cattle, denoted on List A, would be in the category for serious and rapid spread of transmissible diseases and have a serious socio-economic or public health consequences. Most of the diseases on List A are concerned with cattle, swine and birds.

Livestock and crops can be impacted by a slew of diseases. The focus for this analysis was on cattle and crop diseases. The focal point diseases were determined based on the uses of agricultural land and on the potential types of threats to the region. In 2002, the West Piedmont region had 3,250 farms with a total of 604,819 acres in farmland.

Vulnerability Analysis

The West Piedmont region has a significant amount of farm lands, in both crops and livestock. A vulnerability analysis for the region was completed based on the US Department of Agriculture's agriculture census. Figures V-22 through V-26 illustrate the different portions of the planning area that could potentially be susceptible to agriterrorism, given what type of farmland is located there. Diseases, location, mode of transportation and the primary animals impacted were taken into account when developing the vulnerability analyses. Crop and cattle were concentrated on as a result of the large number of farms that raise these types of products.

Areas that are more susceptible to bacterial and fungal crop diseases are represented in Figure V-21. Patrick, Franklin and Pittsylvania Counties have a large amount of crop farms and as a result would be more susceptible to crop-related diseases and terrorism tactics.

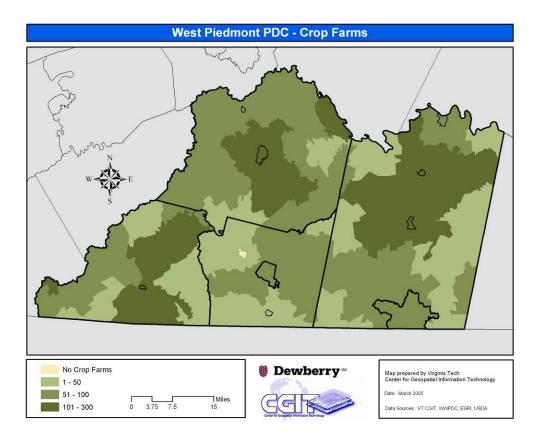


Figure V-21. West Piedmont Region Crop Farm Distribution

Areas that are more susceptible to avian influenza and Newcastle diseases are represented in Figure V-22. All of the communities in the planning district have a relatively small number of bird farms and as a result should have a lower concern for avian diseases.

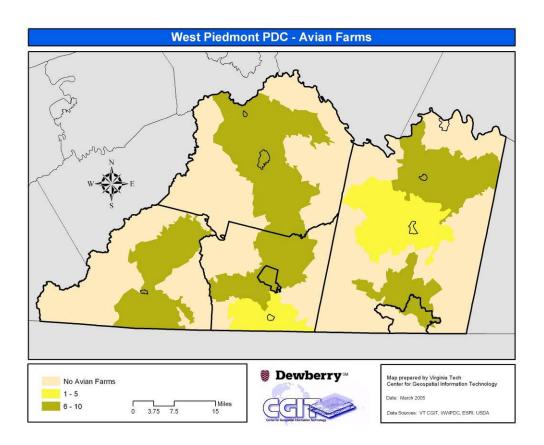


Figure V-22. West Piedmont Region Avian Farm Distribution

Areas that are more susceptible to cattle diseases are represented in Figure V-23. Patrick, Franklin and Pittsylvania Counties have a large amount of cattle farms and would therefore be more susceptible to cattle-related diseases and terrorism tactics.

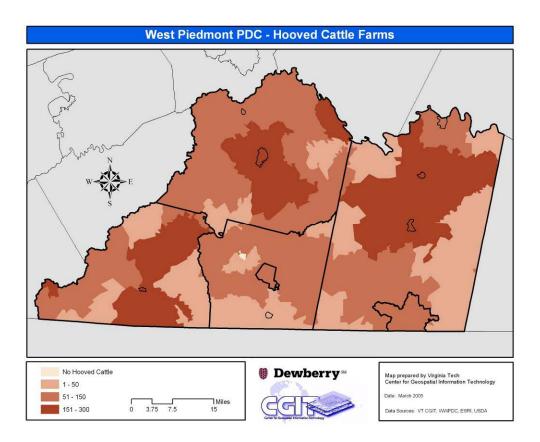


Figure V-23. West Piedmont Region Cattle Farm Distribution

Areas that are more susceptible to swine diseases are represented in Figure V-24. Pittsylvania County and a small portion of Patrick County are the only communities in the region that have small swine farms. These localized regions would be susceptible to swine related diseases and terrorism tactics.

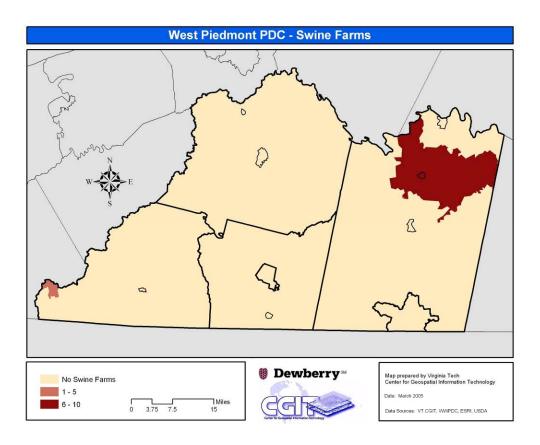


Figure V-24. West Piedmont Region Swine Farm Distribution

Areas that are more susceptible to foot and mouth diseases are represented in Figure V-25. Patrick, Franklin and Pittsylvania Counties have a large amount of cloven-hoofed animal farms and would therefore be more susceptible to diseases and terrorism tactics on hoofed animals.

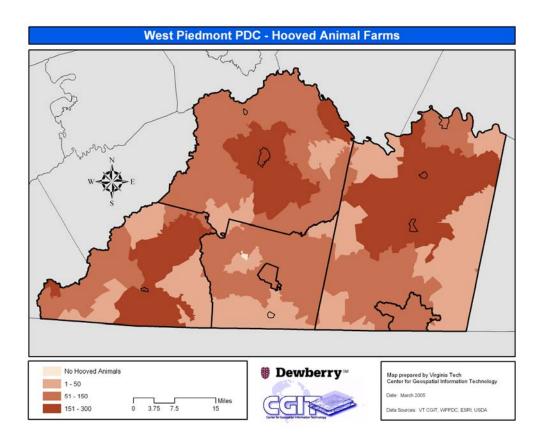


Figure V-25. West Piedmont Region Hoofed Animal Farm Distribution

A strategy to improve available data should be considered for inclusion in the Mitigation Strategy section of this plan.

Section VI. Capability Assessment

Introduction

This portion of the Plan assesses the current capacity of the communities of the West Piedmont Planning District to mitigate the effects of the natural hazards identified in Section V of the plan. This assessment includes a comprehensive examination of the following local government capabilities:

- Staff and Organizational Capability
- Technical Capability
- Fiscal Capability
- Policy and Program Capability
- Legal Authority
- Political Capability

The purpose of conducting the capabilities assessment is to identify potential hazard mitigation opportunities available to the West Piedmont Planning District's local governments, specifically the Counties of Franklin, Henry, Patrick, and Pittsylvania and the Cities of Danville and Martinsville. Careful analysis should detect any existing gaps, shortfalls, or weaknesses within existing governmental activities that could exacerbate a community's vulnerability. The assessment also will highlight the positive measures already in place or being done at the local level, which should continue to be supported and enhanced, if possible, through future mitigation efforts.

The capabilities assessment serves as the foundation for designing an effective hazard mitigation strategy. It not only helps establish the goals and objectives for the Planning District to pursue under this Plan, but assures that those goals and objectives are realistically achievable under given local conditions.

Staff and Organizational Capability

As described previously, the planning area is comprised of four counties and two cities. The counties operate under a Board of Supervisors - County Administrator/Manager system. In this form of government, the elected board of supervisors hires a county administrator who oversees daily operations of the county. Patrick has the smallest board with five members on its Board of Supervisors. Franklin and Pittsylvania Counties have seven-member boards. Henry County has six board members and a tiebreaker.

The City of Danville and the City of Martinsville operate under the City Council – City Manager system. The City Councils are elected and have nine and five members, respectively. They, in turn, appoint a City Manager who acts as the chief administrative officer and oversees daily business operations of the City.

Under the County Administrator or City Manager, each jurisdiction has numerous departments and boards that are responsible for the various functions of local government. The following table highlights the departments in each jurisdiction that could facilitate the implementation of this hazard mitigation plan.

	Table VI-1. Key Departments						
Jurisdiction	Departments						
	Community Development						
	• Emergency Services						
City of Danville	• Fire						
	Public Works						
	• Utilities						
	Building Permits and Inspections						
Franklin County	• Planning						
	Public Safety						
	Code Enforcement and Planning						
	Engineering and Mapping						
Henry County	Public Safety						
	Public Service Authority						
	• Zoning						
	• Community Development (includes Planning,						
City of Martinsville	Zoning, and Inspections)						
	• Fire and EMS						
	Public Works						
Patrick County	Building Inspection						
Tatrick County	Emergency Management						
	Building Inspections						
Pittsylvania County	• Fire and Rescue						
1 Ittsylvaina County	• Planning						
	• Zoning						

In Table VI-1, the departments that have been assigned specifically delegated responsibilities to carry out mitigation activities or hazard control tasks for a specific jurisdiction are bolded and italicized. Representatives of these departments have been

involved in the development of this mitigation plan in order to identify gaps, weaknesses or opportunities for enhancement with existing mitigation programs.

While exact responsibilities differ from jurisdiction to jurisdiction, the general duties of the departments highlighted in Table VI-1 are described below.

The Building Inspections office or department enforces the Virginia Uniform Statewide Building Code (VUSBC). This code includes implications for floodplain management.

The Department of Emergency Management is responsible for the mitigation, preparedness, response and recovery operations that deal with both natural and manmade disaster events. Fire/EMS departments provide medical aid and fire suppression at the scene of accidents and emergencies. These departments are often responsible for responding to hazardous materials incidents. The Department of Public Safety encompasses emergency management and fire safety.

The Planning Department addresses land use planning. This department, depending on the jurisdiction, may enforce the National Flood Insurance Program requirements and other applicable local codes. Zoning also may be managed by the Planning Department or it may be a separate office.

In some jurisdictions, the Public Utilities department oversees community water facilities or natural gas provision. In others, the Public Works Department oversees the maintenance of infrastructure including roadways, sewer and stormwater facilities and the community's water treatment facilities. This department also may review new development plans, ensure compliance with environmental regulations, and work with VDOT on road issues. Depending on the jurisdiction, the Department of Public Works may enforce the National Flood Insurance Program requirements. Public Service Authorities such as those in Henry and Pittsylvania Counties maintain the utility infrastructure of their respective jurisdictions.

For the most part, it was determined that the departments are adequately staffed, trained, and funded to accomplish their missions.

Technical Capability

Mitigation cuts across many disciplines. For a successful mitigation program, it is necessary to have a broad range of people involved with diverse backgrounds. These people include planners, engineers, building inspectors, emergency managers,

floodplain managers, people familiar with Geographic Information Systems (GIS), and grant writers.

GIS systems can best be described as a set of tools (hardware, software and people) used to collect, manage, analyze and display spatially-referenced data. Many local governments are now incorporating GIS systems into their existing planning and management operations. GIS is invaluable in identifying areas vulnerable to hazards. Access to the Internet can facilitate plan development, public outreach, and project implementation.

Table VI-2 summarizes the technical capabilities of the jurisdictions. When provided, the specific department that has the technical capability is identified.

	Table VI-2. Technical Capability Matrix										
Jurisdiction	Land Use Planners	Civil or Building Engineers	Emergency manager	Floodplain manager	Staff knowledgeable about hazards	GIS staff	Grant writers	Internet access?			
City of Danville	Community Development, Planning	Public Works, Engineering	Emergency Operations	Community Development	Emergency Operations	Information Technology	Community Development, City Administration	✓			
Franklin County	Planning	County Engineer	Public Safety	Planning & Zoning	Public Safety, Planning	Information Technology	County Administration, Public Safety	√			
Henry County	Planning	Planning/Ins pection	Public Safety	Planning/Inspe ction	Public Safety	Mapping Dept.	Planning	✓			
City of Martinsville	Community Development	Public Works/ Community Development	Public Safety	Inspections	Public Works/ Community Development	Public Works	Public Works/ Community Development	✓			
Patrick County			Emergency Management	Building Inspection	Emergency Management		County Administration	✓			
Pittsylvania County	Planning	Building Inspections/ Code Compliance	Emergency Management	Code Compliance	Planning, Code Compliance, Emergency Management	Information Technology	Grants Administration	✓			

As can be seen in the table, most jurisdictions have one or more departments that have technical capability in each category. The staff at all of the jurisdictions have Internet access. All of the jurisdictions have government websites that could be utilized to promote hazard mitigation. Each local government also provides access to on-line GIS mapping.

Henry County uses monitors from the Integrated Flood Observation and Warning System (IFLOWS) and several stream gauges to track potential flood conditions. Warnings can be issued using the Emergency Alert System. Alternatively, officials may chose to drive through potentially impacted neighborhoods and use loudspeakers or go door-to-door to warn people.

Fiscal Capability

For Fiscal Year 2004, the budgets of the participating jurisdictions range from \$31 million (Patrick County) to \$171 million (City of Danville). Table VI-3 shows the total budget amounts for each jurisdiction in addition to the amount budgeted for public safety.

The counties and cities receive most of their revenue through state and local sales tax, local services, and through restricted intergovernmental contributions (federal and state pass through dollars). It is unlikely that any of the counties or cities could easily afford to provide the local match for the existing hazard mitigation grant programs. Considering the current budget deficits at both the state and local government level, in Virginia, combined with the apparent increased reliance on local accountability by the federal government, this is a significant and growing concern.

Under the Disaster Mitigation Act of 2000, FEMA has made special accommodations for "small and impoverished communities," who will be eligible for a 90% federal share, 10% non-Federal cost share for projects funded through the Pre-Disaster Mitigation (PDM) grant program. The definition is restricted to "communities of 3,000 or fewer individuals that is identified by the State as a rural community." According to the current Interim Final Rule for Section 322 of the Act, none of the jurisdictions in the planning area will qualify as a small and impoverished community.

Table VI-3. Fiscal Capability Matrix										
Jurisdiction	Overall FY04-05 Budget	Public Works	Public Safety FY04-05 Budget	Planning						
City of Danville	\$171M ¹²	\$9.6M	\$20.5M	\$.9M ¹³						
Franklin County	\$91M	\$2.3M	\$1.6M	\$.4M						
Henry County	\$102M	N/A	\$8.4M	N/A						
City of Martinsville	N/A	N/A	N/A	N/A						
Patrick County	\$31M	N/A	\$525K	N/A						
Pittsylvania County	\$121M	\$1M	\$9M	\$.1M						

As can be seen in Table VI-4, the jurisdictions in the planning area are accustomed to using a variety of financial tools. The ability to use these tools for hazard mitigation, however, differs from jurisdiction to jurisdiction.

As the table shows, virtually every jurisdiction uses a capital improvements program to plan for major expenditures and capital investments. Also, all of the jurisdictions have or are using Community Development Block Grant funds. The use of fees for public utilities varies from jurisdiction to jurisdiction, though none currently have a stormwater management fee. Only the City of Martinsville has used a special purpose tax or tax district.

¹² FY03-04 budget. <u>http://www.danville-va.gov/upload/images/City%20Manager/Budget%20Summary.pdf</u>

¹³ Community Development allocation

Table VI-4. Financing Mechanisms by Jurisdiction										
Jurisdiction	Develop- ment impact fees	Capitol improve- ment program- ming	CDBG	General obligation, revenue and/or special tax bonds	Special purpose taxes or taxing district	Gas/electric fees	Water/ sewer fees	Stormwater utility fees	Intergovern -mental agreements	
City of Danville		✓	✓	✓		✓	✓		✓	
Franklin County		✓	✓				✓			
Henry County		✓	✓	✓		✓			✓	
City of Martins- ville		✓	✓	✓	✓	✓	✓			
Patrick County		✓	✓							
Pittsyl- vania County		✓	✓	✓			✓			

Policy and Program Capability

Previous and Current Mitigation Efforts

Henry County received Hazard Mitigation Grant Program (HMGP) funds in April 2005 for the Marrowbone Circle Project. The project consists of purchasing three brick residential structures along Marrowbone Creek in the Ridgeway area of Henry County. The homes have sustained damage from flooding in September 1996, September 2000, February 2003, June 2003, July 2003, June 2004, and September 04. The project involves acquisition and demolition of the homes.

Henry County, along with the Blue Ridge Soil and Water Conservation District, is involved in a \$2.7 million Marrowbone Dam rehabilitation project to bring the dam up to current design and safety criteria. The project, which is expected to be completed in September 2005, includes building a roller-compacted concrete spillway to replace the current earthen spillway, raising the top of the dam by 8.5 feet and backfilling the existing emergency spillway to bring it up to the same elevation as the dam.¹⁴

Danville is the first *StormReady* community in the State of Virginia. *StormReady* is a voluntary initiative sponsored by the National Weather Service. To become a member of the program, a community must meet certain criteria such as having multiple means to receive and send weather warnings and implementing a public education campaign. Danville's participation in this effort was spurred in part by the 2004 tornadoes. The City of Danville used HMGP funds to elevate its Public Works garage.

Pittsylvania County's school board implemented the Saf-T-Net ALERTNOW Emergency Notification Service in October 2004. This service alerts parents of emergency situations at the school and provides instructions on how to respond. In addition, the system can be used to provide notifications regarding weather closures. Henry County schools implemented a similar program in September 2004. Henry County schools get storm warnings directly from the National Weather Service via special weather radios with alarms. In addition, during 2004, an alarm system was installed at each Martinsville school, letting City officials immediately notify school employees of emergencies such as severe weather.

Patrick County is located at the headwaters of numerous tributaries of the Dan River. The area has been extensively studied by the U.S. Army Corps of Engineers, the

¹⁴ Martinsville Bulletin. *Marrowbone Dam rehab starts*. June 22, 2005.

Virginia State Water Control Board and other agencies. The purpose of the study was to determine "effective ways and means of controlling flooding downstream on the Dan River." A number of solutions were considered but the study was not continued because of local and regional objections, in part because one of the proposed solutions called for the flooding of substantial parts of Patrick and Henry Counties.

Patrick County received Community Development Block Grant funds and assistance from the U.S Army Corps of Engineers to construct a diversion channel to control and prevent flooding on the South Mayo River. The project was completed in 1987 and was spurred, in part, by concern about the impact of flooding on industry and business (e.g., International Paper in Stuart). Patrick County also has worked with Support to Eliminate Poverty, Incorporated (STEP) to provide weatherization services to lower-income residents.

In response to concerns after a drought, Pittsylvania County and the towns of Chatham and Gretna have worked to expand access to public water supplies. The County is currently leading a project to install a raw water pipeline from Leesville Lake to a reservoir outside of the Town of Gretna. The project is funded by County funds including a grant from the U.S. EPA and a grant from the Virginia Tobacco Indemnification and Community Revitalization Commission. The project costs are estimated to be several million dollars but full funding has not yet been identified. A million dollar grant from the Economic Development Administration is also underway to interconnect the Henry and Pittsylvania Counties water systems. This project, in part, will provide fire flow for an industrial park in Pittsylvania County.

Emergency Operations Plan

A Comprehensive Emergency Management Plan typically predetermines actions to be taken by government agencies and private organizations in response to an emergency or disaster event. For the most part, the plan describes the jurisdiction's capabilities to respond to emergencies and establishes the responsibilities and procedures for responding effectively to the actual occurrence of a disaster. In addition, some of the plans describe the hazardous materials risk present in the jurisdiction (e.g., Henry, Pittsylvania). A Regional Hazard Materials Team located in the City of Danville covers most of the Planning District area with the exception of Franklin County which falls into the Roanoke region.

Hazard mitigation generally is addressed through an annex to the plan. The annex lays out roles and responsibilities related to hazard mitigation for various agencies and departments. For those counties with Emergency Operations Plans, there are no foreseeable conflicts between that plan and this hazard mitigation plan.

Floodplain Management

Communities that regulate development in floodplains are able to participate in the National Flood Insurance Program (NFIP). In return, the NFIP makes federally-backed flood insurance policies available for eligible properties in the community. Table VI-5 shows when each of the jurisdictions began participating in NFIP. The table also provides the date of the Flood Insurance Rate Map in effect in each community. These maps were developed by FEMA or its predecessor and show the boundaries of the 100-year and 500-year floods. As the table shows, six of the maps are over twenty years old and two of the maps are almost fifteen years old. Parts of the planning area have experienced dramatic growth over the past decade that is not reflected in the FIRM. This difference may mean that the actual floodplain varies from that depicted on the map.

Table VI-5. NFIP Entry and FIRM Date								
Jurisdiction	Entry into NFIP	Date of Current FIRM	Stand alone or part of zoning ordinance?					
City of Danville	03/16/81 08/09/01		Zoning					
Franklin County	05/19/81	05/19/81 10/05/01						
Henry County	11/05/80	11/05/80	Stand alone					
City of Martinsville	04/01/81	04/01/81	Stand alone					
Patrick County	05/15/84	03/05/90	Stand alone					
Pittsylvania County	11/04/81	08/09/01	Zoning					
Town of Boones Mill	09/01/78	09/01/78	Stand alone					
Town of Chatham	02/01/79	02/01/79	Stand alone					
Town of Hurt	04/02/79	08/15/83	Stand alone					
Town of Ridgeway	11/06/81	11/06/81	Unknown					
Town of Rocky Mount	05/01/80	11/08/99	Zoning					
Town of Stuart	09/01/78	05/03/90	Stand alone					

Virginia State statutes provide cities and counties the land use authority. In particular, issues such as floodwater control are empowered through §15.2-2223 and §15.2-2280. All of the jurisdictions in the planning area have adopted a local floodplain ordinance as a requirement of participation in the National Flood Insurance Program. Table VI-5 shows if the community has adopted a stand alone ordinance or if it has incorporated floodplain regulations into its zoning ordinance.

The Town of Rocky Mount is the only jurisdiction in the planning area to require that electric water heaters, furnaces and other installations be elevated above the 100-year base flood elevation.

The Community Rating System (CRS) was implemented in 1990 as a program for recognizing and encouraging community floodplain management activities that exceed the minimum NFIP standards. Residents of communities that participate in CRS receive a reduction in the flood insurance premium. There are ten CRS classes: class 1 requires the most credit points and gives the largest premium reduction; class 10 receives no premium reduction. None of the jurisdictions in this hazard mitigation plan are members of the CRS.

One of the CRS requirements is a community floodplain management plan. The West Piedmont hazard mitigation plan is intended to fulfill the CRS planning requirement should the planning jurisdictions decide to enter the CRS.

Comprehensive Plan

A community's comprehensive plan provides the future vision for the community regarding growth and development. To the extent that hazard mitigation principles are addressed in the West Piedmont's communities' Comprehensive Plans, it generally is in the context of floodplain protection or stormwater management. Henry and Patrick Counties also address the need for emergency communications networks.

Appendix C provides excerpts and greater detail on each jurisdiction's comprehensive plan.

City of Danville

The City of Danville's Comprehensive Plan emphasizes the use of "smart growth" performance standards based on land holding capacities. Based on this principle, the plan classifies land into the "Planning Area" which is developable and "Primary Environmentally Sensitive Areas," which are non-developable and comprises contiguous areas of sensitive soils, steep slopes, wetlands and floodplains.

While the plan does not address hazard mitigation specifically, it does note the need to update the zoning ordinance to specifically address floodplains among other sensitive areas. The plan also suggests that a comprehensive stormwater management plan be developed for the City including improved drainage solutions for older neighborhoods that experience flooding. The plan notes that these projects could be supported by CIP.

Franklin County

Floodplain management is prominently featured in Franklin County's Comprehensive Plan. One objective in the plan states, "protect environmentally sensitive areas from development," while the supporting strategies suggest that new construction in flood hazard areas that results in any increase in flood levels of the 100-year storm be prohibited. The Plan also includes strategies related to stormwater management and public outreach regarding environmental regulations.

Another policy in the plan states that the County will use a GIS system that includes floodplain information to improve future land use decision-making.

Henry County

Henry County's Comprehensive Plan recognizes the need to be proactive in land use planning in order to reduce flooding and flood-related problems. Several strategies also address acquisition of land for open space and recreation. Implementation of these strategies could provide an opportunity to acquire flood-prone lands. Henry County's plan also calls for a modern emergency services communication network to be maintained.

City of Martinsville

Stormwater management is the focus of the City of Martinsville's Comprehensive Plan with respect to hazard mitigation. The plan calls for a comprehensive stormwater management plan to be developed. Of particular concern are the neighborhoods of Westside and Southside. Floodplain management is not addressed in the plan.

Patrick County

Like Henry County, Patrick County's Comprehensive Plan addresses the need to maintain a modern emergency services communication network. The plan also includes numerous strategies related to floodplain protection, such as encouraging the use of the floodway fringe areas for recreational uses, open space, and other non-structural uses.

The Plan also suggests that an environmental and good land practices program be developed in association with realtors, developers, builders, and bankers to enhance awareness among the professional community associated with land use and land development.

Pittsylvania County

The Pittsylvania County Comprehensive Plan also addresses floodplain conservation. The plan suggests that floodplains be used as permanent conservation areas and that construction of permanent structures be discouraged. In general, environmental constraints to development should be recognized according to the plan. The Comprehensive Plan also suggests that the County adopt a fire prevention code.

			Table V	I-6. Availab	ility of Plar	s and their	Support fo	or Hazard Mit	tigation			
Jurisdicti on	CIP	Comp. LU Plan	Econ. Dev. Plan	Emergen cy Operatio ns Plan	Floodpla in Manage ment Plan	HazMat Plan	Histori c Pres. Plan	Local Hazard Mitigation Plan	Open Space Plan	Post- Disaster Redev. Plan	Rad Respons e Plan	Storm H ₂ O Manage ment Plan
City of Danville	Н	Н	Н	Н	Н	✓	M	UD	✓			Н
Franklin County	Н	Н	M (UD)	Н	Н	Н		UD	M	Н	Н	Н
Henry County	M	M		M	Н	M	M/L (UD)	UD				M
City of Martins- ville	✓	М			M	M (UD)		UD	M	М		M (UD)
Patrick County		Н	Н	M	Н		M	UD	M	Н	M	Н
Pittsyl- vania County	M	M (UR)		Н	Н	Н		UD				

^{✓ =} Plan exists, no assessment of relationship to hazard mitigation

H = Strongly supports = specifically includes hazard mitigation

M = Helps facilitate = elements could be used to support hazard mitigation

L = Hinders = no mention of hazard mitigation and does not contain elements that would support hazard mitigation or includes elements that would hinder hazard mitigation

Legal Authority

Local governments in Virginia have a wide range of tools available to them for implementing mitigation programs, policies and actions. A hazard mitigation program can utilize any or all of the four broad types of government powers granted by the State of Virginia, which are (a) regulation, (b) acquisition, (c) taxation, and (d) spending. The scope of this local authority is subject to constraints, however, as all of Virginia's political subdivisions must not act without proper delegation from the state. All power is vested in the state and can only be exercised by local governments to the extent it is delegated. Thus, this portion of the capabilities assessment will summarize Virginia's enabling legislation which grants the four types of government powers listed above within the context of available hazard mitigation tools and techniques.

Regulation

General Police Power

Virginia's local governments have been granted broad regulatory powers in their jurisdictions. Virginia State Statutes bestow the general police power on local governments, allowing them to enact and enforce ordinances which define, prohibit, regulate or abate acts, omissions, or conditions detrimental to the health, safety, and welfare of the people, and to define and abate nuisances (including public health nuisances). Since hazard mitigation can be included under the police power (as protection of public health, safety and welfare), towns, cities, and counties may include requirements for hazard mitigation in local ordinances. Local governments also may use their ordinance-making power to abate "nuisances," which could include, by local definition, any activity or condition making people or property more vulnerable to any hazard.

All of the jurisdictions in the planning area have enacted and enforce regulatory ordinances designed to promote the public health, safety, and general welfare of its citizenry. Appendix C provides excerpts and greater detail on each jurisdiction's relevant ordinances including zoning and floodplain management ordinances.

Land Use

Regulatory powers granted by the state to local governments are the most basic manner in which a local government can control the use of land within its jurisdiction. Through various land use regulatory powers, a local government can control the amount, timing, density, quality, and location of new development. All these characteristics of growth can determine the level of vulnerability of the community in the event of a natural hazard. Land use regulatory powers include the

power to engage in planning, enact and enforce zoning ordinances, floodplain ordinances, and subdivision controls. Each local community possesses the power to prevent or limit unsuitable development in hazard-prone areas.

Planning

According to State Statutes, local governments in Virginia may create or designate a planning agency. The planning agency may perform a number of duties, including:

- ❖ Make studies of the area;
- Determine objectives;
- Prepare and adopt plans for achieving those objectives;
- Develop and recommend policies, ordinances, and administrative means to implement plans; and
- Perform other related duties.

The importance of the planning powers of local governments is illustrated by the requirement that zoning regulations be made in accordance with a comprehensive plan. While the ordinance itself may provide evidence that zoning is being conducted "in accordance with a plan," the existence of a separate planning document ensures that the government is developing regulations and ordinances that are consistent with the overall goals of the community. All of the jurisdictions within the planning area except Patrick County have planning departments and comprehensive plans. Patrick County does not have a planning department.

Zoning

Zoning is the traditional and most common tool available to local governments to control the use of land. Broad enabling authority is granted for municipalities and counties in Virginia to engage in zoning. Land "uses" controlled by zoning include the type of use (e.g., residential, commercial, and industrial) as well as minimum specifications that control height and bulk such as lot size, building height and set backs, and density of population. Local governments are authorized to divide their territorial jurisdiction into districts, and to regulate and restrict the erection, construction, reconstruction, alteration, repair or use of buildings, structures, or land within those districts. Districts may include general use districts, overlay districts, and special use or conditional use districts. Zoning ordinances consist of maps and written text.

The Cities of Danville and Martinsville along with Pittsylvania County implement their floodplain regulations via the zoning ordinance. An overlay district is used to impose additional requirements on properties within the designated floodplain area.

In addition, Franklin, Henry, and Pittsylvania Counties use a Conservation District to further protect sensitive lands. Patrick County limits zoning to the Goose Point area near Philpott Lake. The regulations are designed to protect the environment and prevent overcrowding.

Subdivision Regulations

Subdivision regulations control the division of land into parcels for the purpose of building development or sale. Flood-related subdivision controls typically require that sub-dividers install adequate drainage facilities and design water and sewer systems to minimize flood damage and contamination. They also may prohibit the subdivision of land subject to flooding unless flood hazards are overcome through filling or other measures, and they prohibit filling of floodway areas.

All of the cities and counties in the planning area have adopted a subdivision ordinance. Most of the ordinances contain flood-specific provisions. For instance, Franklin, Henry, and Pittsylvania Counties and the City of Martinsville require that flood-prone land be deemed unsuitable for development and is not allowed to be platted as part of a subdivision. The City of Danville requires that subdivisions with only one means of ingress ensure that floodwaters will not block that ingress. The City of Martinsville and Henry and Pittsylvania Counties require that fire hydrants be installed to provide adequate fire protection. Finally, Patrick County may require that drainage easements be given to address storm and floodwater runoff issues.

Floodplain Regulation

All of the communities in the planning area have adopted floodplain regulations. Generally, the regulations adopted by the planning communities meet but do not exceed the minimum standards of the National Flood Insurance Program. The City of Danville, however, requires freeboard for residential and commercial structures. In addition, the Town of Rocky Mount requires that water heaters and other major appliances be elevated. Franklin and Pittsylvania Counties and the City of Danville require, in their floodplain ordinance, that manufactured homes be elevated and anchored if in the floodplain district.

Building Codes and Building Inspection

Many structural mitigation measures involve constructing and retrofitting homes, businesses and other structures according to standards designed to make the buildings more resilient to the impacts of natural hazards. Many of these standards are imposed

through building codes. All of the jurisdictions have adopted the Uniform Virginia Building Code.

Local governments in Virginia also are empowered to carry out building inspections. It empowers cities and counties to create an inspection department, and enumerates their duties and responsibilities, which include enforcing state and local laws relating to the construction of buildings, installation of plumbing, electrical, and heating systems; building maintenance; and other matters. All of the jurisdictions have established a Building Inspections Office to carry out its building inspections.

Fire Codes

Virginia has a statewide fire code that is enforced by state fire marshals. The code establishes statewide standards to safeguard life and property from the hazards of fire or explosion arising from the improper maintenance of life safety and fire prevention and protection materials, devices, systems and structures. Localities may choose to adopt stricter standards and/or employ their own fire marshals. There are reciprocal agreements for fire, rescue, and law enforcement.

Other Ordinances

The City of Danville has enacted a hazardous tree ordinance. The ordinance states: "Any tree which, by virtue of its condition and location, endangers the life, health, or safety of any person or structure on adjacent or adjoining real property is hereby declared to be a public nuisance and prohibited."

The Director of Public Works is responsible for notifying private property owners if a tree on their property has been identified as a hazardous tree. The director is empowered to remove the tree if it poses an immediate threat.

Table VI-7 summarizes the various ordinances that are in effect in the jurisdictions in the planning area.

	Table VI-7. Availability of Ordinances and their Support for Hazard Mitigation										
Jurisdiction	Building Code	Fire Code	Floodplain Management Ordinance	Post-Disaster Reconstruction /Redevelopme nt Ordinance	Subdivision Ordinance	Unified Development Ordinance	Zoning Ordinance				
City of Danville	Н	Н	Н		Н		Н				
Franklin County	Н	М	Н	M(UD)	Н		Н				
Henry County	M	M	Н		M		M				
City of Martinsville	M	M	M		M	M	M				
Patrick County	Н	✓	Н		Н		Н				
Pittsylvania County	Н	Н	Н		M		M				

^{✓ =} Ordinance exists, no assessment of relationship to hazard mitigation

H = specifically includes hazard mitigation

M = elements could be used to support hazard mitigation

L = no mention of hazard mitigation and does not contain elements that would support hazard mitigation or includes elements that would hinder hazard mitigation

UD = Under development

West Piedmont Planning District Commission Hazard Mitigation Plan

Acquisition

The power of acquisition can be a useful tool for pursuing local mitigation goals. Local governments may find the most effective method for completely "hazardproofing" a particular piece of property or area is to acquire the property (either in fee simple or a lesser interest, such as an easement), thus removing the property from the private market and eliminating or reducing the possibility of inappropriate development occurring. Virginia legislation empowers cities, towns, and counties to acquire property for public purpose by gift, grant, devise, bequest, exchange, purchase, lease or eminent domain.

Acquisition has been implemented by Henry County to acquire a few private properties within flood-prone areas of the County. The majority of the communities in the planning area have not used acquisition though it has been used successfully in other parts of Virginia.

Taxation

The power to levy taxes and special assessments is an important tool delegated to local governments by Virginia law. The power of taxation extends beyond merely the collection of revenue, and can have a profound impact on the pattern of development in the community. Communities have the ability through special legislation to set preferential tax rates for areas that are more suitable for development in order to discourage development in otherwise hazardous areas. Local units of government also have the ability to levy special assessments on property owners for all or part of the costs of acquiring, constructing, reconstructing, extending or otherwise building or improving flood protection works within a designated area. This can serve to increase the cost of building in such areas, thereby discouraging development.

Because the usual methods of apportionment seem mechanical and arbitrary, and because the tax burden on a particular piece of property is often quite large, the major constraint in using special assessments is political. Special assessments seem to offer little in terms of control over land use in developing areas. They can, however, be used to finance the provision of necessary services within municipal or county boundaries. In addition, they are useful in distributing the costs of the infrastructure required by new development to the new property owners.

Localities in Virginia collect a 1% sales tax. In addition, all of the counties and cities in the planning area levy property taxes. As noted in Table VI-4, the City of Martinsville also uses special purpose taxes.

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Spending

The fourth major power that has been delegated from the Virginia General Assembly to local governments is the power to make expenditures in the public interest. Hazard mitigation principles should be made a routine part of all spending decisions made by the local government, including the adoption of annual budgets and the Capital Improvement Plan (CIP).

A CIP is a schedule for the provision of municipal or county services over a specified period of time. Capital programming, by itself, can be used as a growth management technique, with a view to hazard mitigation. By tentatively committing itself to a timetable for the provision of capital to extend services, a community can control growth to some extent, especially in areas where the provision of on-site sewage disposal and water supply are unusually expensive.

In addition to formulating a timetable for the provision of services, a local community can regulate the extension of and access to services. A CIP that is coordinated with extension and access policies can provide a significant degree of control over the location and timing of growth. These tools also can influence the cost of growth. If the CIP is effective in directing growth away from environmentally sensitive or high hazard areas, for example, it can reduce environmental costs.

All of the jurisdictions in the planning area have some form of a capital improvements program.

Political Capability

The West Piedmont region's history of natural disasters such as the tornadoes of September 2004 makes it likely that the current and future political climates will be favorable towards supporting and advancing future hazard mitigation strategies. Political willpower to implement hazard mitigation programs should be strong.

In general, several obstacles can make hazard mitigation difficult to implement at the local level. Desirable areas for development, such as lake or riverfront properties, are often also hazardous places to build. Local government must balance the economic benefits and demand for building in such places with the public and private costs that future disasters could inflict. In addition, in areas that are already developed, implementing mitigation actions can be costly. Part of this hazard mitigation plan's mission will be to weigh the costs and benefits of such retrofitting projects to ensure that only those that are cost-effective will be chosen.

Hazard mitigation also may not be judged as high a community priority as other projects such as a school building or utility improvement. This makes it particularly

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important to demonstrate how hazard mitigation should be integrated into all community decision-making as opposed to a stand-alone issue.

Summary

Much of the information in this capability assessment was provided by the jurisdictions in the planning area via a capability assessment survey. The last portion of the survey asked the jurisdictions to provide a self-assessment of their capabilities. This section of the plan has provided a more detailed analysis of their capabilities. Table VI-8 summarizes the self-reported capability assessment. As the table shows, all of the jurisdictions rate themselves as having medium to low capability in the various categories.

Table VI-8. Capability Self-Assessment									
Jurisdiction	Planning and Regulatory Capability	Administra tive and Technical Capability	Fiscal Capability	Political Capability	Overall Capability				
City of Danville	M	M	M	M	M				
Franklin County	M	L	L	M	M				
Henry County	L	L	L	L	L				
City of Martinsville	L	L	L	M	L				
Patrick County	L	M	L	M	M				
Pittsylvania County	M	M	M	M	M				

Section VII. Mitigation Strategy

This section of the Hazard Mitigation Plan describes the most challenging part of any such planning effort – the development of a Mitigation Strategy. It is a process of:

- 1. Setting mitigation goals,
- 2. Considering mitigation alternatives,
- 3. Identifying objectives and strategies, and
- 4. Developing a mitigation action plan.

Setting Mitigation Goals

The hazard mitigation planning process conducted by the Mitigation Advisory Committee (MAC) is a typical problem-solving methodology:

- Describe the problem (Hazard Identification),
- Estimate the impacts the problem could cause (Vulnerability Assessment),
- Assess what safeguards exist that might already or could potentially lessen those impacts (Capability Assessment), and
- Using this information, determine what, if anything, can be done, and select those actions that are appropriate for the community in question (Develop an Action Plan).

When a community decides that certain risks are unacceptable and that certain mitigation actions may be achievable, the development of *goals* and *objectives* takes place. Goals and objectives help to describe what actions should occur, using increasingly narrow descriptors. Initially, long-term and general statements known as broad-based goals, are developed. Goals then are accomplished by meeting objectives, which are specific and achievable in a finite time period. In most cases there is a third level, called *strategies*, which are detailed and specific methods to meet the objectives. When developing the goals and objectives for this plan, the MAC was provided with the model below as an example of this relationship. The example was taken from a plan developed for Holden Beach, North Carolina.

GOAL Improve public awareness.						
Objectives						
Educate the public about hazards Maintain and publicize current evacuation routes						
A	ctions					
Hold a Town-sponsored hazard mitigation seminar for the community residents, including information on preparedness for all hazards significant to Holden Beach.	The Town should publicize, on the Town's website, maps of evacuation routes which will facilitate the evacuation of Holden Beach in case of a hazardous event.					

The MAC discussed goals and objectives for this plan at two points in the planning process. First, the MAC attended a workshop on April 6, 2005, to discuss the results of the hazard identification and risk assessments and begin developing the mitigation strategy by discussing mitigation goals. These goals were broad and applicable to the region. Then, each jurisdiction determined if additional individual goals and objectives were required for their jurisdictions.

Strategies, or actions, were developed as a logical extension of the plan's objectives. Most of these actions are dynamic and can change. These actions have been organized into a Mitigation Action Plan for the Planning District and its member jurisdictions.

Data collection supports the goals, objectives and recommended actions in two ways. First, the Hazard Identification/Vulnerability Assessment data identifies areas exposed to hazards, at-risk critical facilities, and future development at risk. Second, the Capability Assessment data identifies areas for integration of hazard mitigation into existing polices and plans.

The MAC members used the results of the data collection efforts to develop goals and prioritize actions for the region and their jurisdiction. The priorities differ somewhat from jurisdiction to jurisdiction. Each jurisdiction's priorities were developed based on past damages, existing exposure to risk, other community goals, and weaknesses identified by the local government capability assessments.

The following goals and their associated objectives form the basis for the development of mitigation strategies and individual Action Plans for each jurisdiction and the region.

- 1. To protect persons and property, and reduce future damage and losses to the community
- 2. Implement activities that assist in protecting lives by making homes, businesses, infrastructure, critical facilities, and other property more resistant to natural hazards
- 3. Protect new and existing public and private infrastructure and facilities from the effects of hazards
- 4. Ensure continued functionality of critical services
- 5. Enhance the capabilities and capacity of local government to lessen the impacts of future disasters
- 6. Develop and implement education and outreach programs to increase public awareness of the risks associated with natural hazards
- 7. Promote hazard mitigation as a public value in recognition of its importance to the health, safety, and welfare of the population

Considering Mitigation Alternatives

During the presentation of findings meeting, the MAC reviewed and commented on the draft HIRA. Discussions held during the meeting resulted in the generation of a range of potential mitigation goals and actions to address the hazards. A range of alternatives were then identified and provided to the MAC for consideration. These alternatives are presented in Appendix E.

The MAC also was provided with a copy of *Tools and Techniques: An Encyclopedia* of *Strategies to Mitigate the Impacts of Natural Hazards* to use as a resource to identify potential mitigation actions.

Prioritizing Alternatives

The MAC used the STAPLE/E (Social, Technical, Administrative, Political, Legal, Economic, and Environmental) Criteria to select and prioritize the most appropriate mitigation alternatives for the Planning District communities. This methodology requires that social, technical, administrative, political, legal, economic, and environmental considerations be taken into account when reviewing potential actions for the area's jurisdictions to undertake. This process was used to help ensure that the

most equitable and feasible actions would be undertaken based on a jurisdiction's capabilities.

Table VII-1, below, provides information regarding the review and selection criteria for alternatives.

Table VII-1. STAPLE/E Review and Selection Criteria for Alternatives

Social

- Is the proposed action socially acceptable to the community(s)?
- Are there equity issues involved that would mean that one segment of a community is treated unfairly?
- Will the action cause social disruption?

Technical

- Will the proposed action work?
- Will it create more problems than it solves?
- Does it solve a problem or only a symptom?
- Is it the most useful action in light of other community(s) goals?

Administrative

- Can the community(s) implement the action?
- Is there someone to coordinate and lead the effort?
- Is there sufficient funding, staff, and technical support available?
- Are there ongoing administrative requirements that need to be met?

Political

- Is the action politically acceptable?
- Is there public support both to implement and to maintain the project?

Lega

- Is the community(s) authorized to implement the proposed action? Is there a clear legal basis or precedent for this activity?
- Are there legal side effects? Could the activity be construed as a taking?
- Is the proposed action allowed by a comprehensive plan, or must a comprehensive plan be amended to allow the proposed action?
- Will the community(s) be liable for action or lack of action?
- Will the activity be challenged?

Economic

- What are the costs and benefits of this action?
- Do the benefits exceed the costs?
- Are initial, maintenance, and administrative costs taken into account?
- Has funding been secured for the proposed action? If not, what are the potential funding sources (public, non-profit, and private)?
- How will this action affect the fiscal capability of the community(s)?
- What burden will this action place on the tax base or local economy?
- What are the budget and revenue effects of this activity?
- Does the action contribute to other community goals, such as capital improvements or economic development?
- What benefits will the action provide?

Environmental

• How will the action affect the environment?

Table VII-1. STAPLE/E Review and Selection Criteria for Alternatives

- Will the action need environmental regulatory approvals?
- Will it meet local and state regulatory requirements?
- Are endangered or threatened species likely to be affected?

Ranking was completed in order of relative priority based on the STAPLE/E criteria, as well as the strategy's potential to reduce vulnerability to natural hazards.

Identifying Objectives and Strategies

Goals, Objectives, and Strategies

Through a series of local government workshops and public meetings, the following goals, objectives, and strategies for the Planning District were accepted by the MAC. The goals, objectives, and strategies form the basis for the development of a Mitigation Action Plan and specific mitigation projects to be considered for the Planning District. The process consisted of 1) setting goals, 2) considering mitigation alternatives, 3) identifying objectives and strategies, and 4) developing an action plan results in a mitigation strategy.

Community officials should consider the goals that follow before making community policies, public investment programs, economic development programs, or community development decisions for their communities. Objectives have been developed for each goal. The objectives state a more specific outcome that the jurisdictions of the West Piedmont region expect to accomplish over the next five years. The objectives provide an overall sense of what exactly is desired. The strategies will outline the specific steps necessary to achieve that end.

- Goal 1: To protect persons and property, and reduce future damage and losses to the community
 - Objective 1.1. Improve local warning capabilities.
 - 1.1.1. Increase flood warning capabilities, particularly as they relate to dam failure.
 - 1.1.2. Investigate, develop, or enhance Reverse 911 system or other public notification system. Investigate possible funding sources.
 - 1.1.3. Establish flood level markers along bridges and other structures to indicate the rise of water levels along creeks and rivers in potential flood-prone areas. Work with VDOT and other jurisdictions as needed.
 - o Objective 1.2. Use planning and regulations to reduce risk.
 - 1.2.1. Investigate need for regional stormwater management plan.

- 1.2.2. Include an assessment and associated mapping of the jurisdiction's vulnerability to location-specific hazards and make appropriate recommendations for the use of these hazard areas in a future Comprehensive Plan.
- 1.2.3. Incorporate (or continue to incorporate) mitigation principles into local emergency management and recovery plans.
- 1.2.4. Work with the Virginia Department of Forestry to review local zoning and subdivision ordinances to identify areas to include wildfire mitigation principles.
- 1.2.5. Review and revise, if needed, local floodplain ordinances. Work with the state to coordinate a Community Assistance Visit to identify potential improvements or enhancements to existing floodplain management program.
- 1.2.6. Develop a new Zoning Ordinance or investigate revising the existing Zoning Ordinance to include separate zones or districts with appropriate development criteria for known hazard areas.
- 1.2.7. Review and revise, if needed, existing Subdivision Ordinances to include hazard mitigation-related development criteria in order to regulate the location and construction of buildings and other infrastructure in known hazard areas.
- 1.2.8. Investigate using non-conforming or substantial damage provisions to require hazard retrofitting of existing development.
- 1.2.9. Evaluate the potential costs versus benefits of implementing a freeboard requirement for all new structures in the 100-year floodplain.
- 1.2.10. Integrate the jurisdiction's mitigation plan into current capital improvement plans to ensure that development does not encroach on known hazard areas.
- 1.2.11. Continue to enforce zoning and building codes to prevent/control construction within the floodplain.
- 1.2.12. Develop ordinances that regulate the placement of potentially hazardous critical facilities such as pipelines or high voltage transmission lines.
- Objective 1.3. Use property acquisition techniques to reduce exposure in the floodplain.

- 1.3.1. Use fee simple and/or permanent easement to prevent development in the highest priority undeveloped floodplain (and/or wetlands) areas. Work with land trusts to purchase the land or conservation easements. Use these areas as public open space for passive recreational uses.
- a. 1.3.2. Evaluate properties within the floodplain for possible relocation and/or buy-out. In particular, target FEMA's Repetitive Loss Properties throughout the West Piedmont Region for possible relocation and/or buy-out. Work with land trusts to facilitate purchase of land. (Goal 1)
- Goal 2: Implement activities that assist in protecting lives by making homes, businesses, infrastructure, critical facilities, and other property more resistant to natural hazards.
 - Objective 2.1. Use construction practices and other techniques to reduce vulnerability to natural hazards.
 - 2.1.1. Investigate providing technical assistance for property owners to implement mitigation measures (i.e., strengthening building frame connections; elevating appliances, constructing a wind shelter). (Goal 1)
 - 2.1.2. Identify existing flood-prone structures that may benefit from mitigation measures such as elevation or floodproofing techniques. (Goal 1)
- Goal 3: Protect new and existing public and private infrastructure and facilities from the effects of hazards.
 - Objective 3.1. Undertake actions to protect facilities (i.e., buildings) owned by the community.
 - 3.1.1. Incorporate hazard mitigation techniques into new community facilities to minimize damages.
 - 3.1.2. Investigate all primary and secondary schools to evaluate their resistance to all natural hazards. Prioritize the schools that are used as community shelters.
 - 3.1.3. Investigate critical community facilities, such as county administrative offices, shelters (non-school buildings), fire stations and police stations, to evaluate their resistance to flood and wind hazards. Prioritize facilities in known hazard areas (e.g., floodplains).
 - Objective 3.2. Implement measures to protect utility systems from natural hazards.

- 3.2.1. Investigate all public utility lines to evaluate their resistance to flood, wind, and winter storm hazards.
- 3.2.2. Initiate discussions with public/private utility companies to discuss incorporating mitigation measures into new and pre-existing development and infrastructure repairs. Options include: anchoring heavy equipment such as electrical transformers mounted on poles using additional straps and braces; reducing camber in overhead transmission lines; and providing cover for exposed utilities.
- 3.2.3. Implement a program to seal and vent or raise sewer system components (i.e. manhole covers that are located in the 100-year flood plain or other areas identified as highly probable for flooding). Encourage VDOT to implement this strategy if necessary.
- Objective 3.3. Improve natural and manmade drainage systems to reduce flooding.
 - 3.3.1. Evaluate existing stormwater system to determine if it is adequate for existing (or future) flood hazards.
 - 3.3.2. Identify program of corrective actions to improve stormwater systems' capacity to handle major rain events.
 - 3.3.3. Inspect and clear debris from stormwater drainage system. Encourage VDOT to execute this strategy if needed.
 - 3.3.4. Investigate, develop and/or implement a channel maintenance program consisting of routine inspections and subsequent debris removal to ensure free flow of water in local streams and watercourses. Identify funding opportunities including partnering with local non-governmental or volunteer organization.
- Objective 3.4. Identify and implement ways to reduce flooding of roadways.
 - 3.4.1. Evaluate at-risk roads and implement mitigation measures (e.g., elevation, re-design.) Work with VDOT as needed. (Goal #4)
 - 3.4.2. Identify funding opportunities to replace vulnerable or undersized culvert stream crossings with bridges or larger culverts to reduce flood hazards. (Goal 1)
- Goal 4: Ensure continued functionality of critical services.
 - Objective 4.1. Undertake actions to ensure continued power at critical community facilities.

- 4.1.1. Identify need for backup generators, communications, and/or vehicles at critical public facilities. Develop means to address shortfall identified.
- 4.1.2. Consider providing necessary electrical hook-up, wiring, and switches to allow readily accessible connections to emergency generators at key critical public facilities.
- o Objective 4.2. Undertake activities to provide continuous water service.
 - 4.2.1. Pursue upgrading of water systems to bring additional water sources on-line, to link community systems to provide redundancy, and to provide additional areas with non-well water. (Goal 1)
 - 4.2.2. Identify and protect critical recharge zones in high risk areas.
- Objective 4.3. Reduce amount of time that roads are closed after a natural hazard event.
 - 4.3.1. Initiate (or encourage) road clearing efforts early in wind and winter storms. Develop plan for quick deployment of road clearing equipment. (Goal 1)
 - 4.3.2. Work with VDOT, private utilities, and/or private homeowners to trim or remove trees that could down power lines and block roads.
- Goal 5: Enhance the capabilities and capacity of local government to lessen the impacts of future disasters.
 - Objective 5.1. Enhance or develop plans that improve the community's ability to respond to and recover from disaster.
 - 5.1.1 Develop Continuity of Operations plan.
 - 5.1.2. Develop debris management plan.
 - 5.1.3. Enhance the local emergency operations plan to better address emergency response to hazardous material spills.
 - 5.1.4. In the next update of hazard mitigation plan, include more detailed vulnerability assessments for manmade hazards based on FEMA and VDEM guidance.
 - Objective 5.2. Address training and staffing needs.
 - 5.2.1. Identify training opportunities for staff to enhance their ability to use GIS for emergency management needs.

- 5.2.2. Provide training opportunities to local zoning and building code enforcement staff. Educate them re: damage assessment, mitigation techniques, and other related topics.
- 5.2.3. Staff Emergency Management Office, Public Works, Building Inspections Office and/or Zoning Office at adequate levels.
- 5.2.4. Evaluate the floodplain manager's roles and responsibilities in each local jurisdiction.
- o Objective 5.3. Improve data used for emergency management purposes.
 - 5.3.1. Identify means to coordinate, collect and store damage assessment data in GIS format for each natural hazard event that causes death, injury and or property damage.
 - 5.3.2. Link structure value data with tax parcel GIS database to increase accuracy of loss estimates.
 - 5.3.3. Coordinate with the state to update and digitize community Flood Insurance Rate Maps (FIRMs).
- Goal 6: Develop and implement education and outreach programs to increase public awareness of the risks associated with natural hazards.
 - Objective 6.1. Develop and implement programs that address manmade hazards.
 - 6.1.1. Educate landowners about need to maintain earthen and other privately-owned dams.
 - 6.1.2. Conduct emergency preparedness education campaign targeted at residents and business within dam inundation zones.
 - 6.1.3. Conduct public education on the principles of "sheltering in place."
 - Objective 6.2. Develop and implement programs that educate people about what they can do to make themselves safer from natural hazards.
 - 6.2.1. Distribute information packets to raise awareness regarding the risks present in the West Piedmont region and to provide disaster preparedness information.
 - 6.2.2. Encourage purchase of and training on the use of NOAA radios. Provide NOAA weather radios to public facilities.
 - 6.2.3. Work with local home improvement stores to provide workshops to residents on mitigation techniques.

- 6.2.4. Conduct/support workshop for contractors to help increase their understanding of how to construct buildings to meet and/or exceed current code requirements. Work with homebuilders associations where possible.
- 6.2.5. Educate residents and business owners about reducing possible wind-borne debris (e.g., anchoring storage sheds, moving outdoor furniture indoors, trimming trees).
- 6.2.6. Encourage residents to consider building a wind shelter as part of new construction or to retrofit existing buildings with wind shelters.
- 6.2.7. Target FEMA's Repetitive Loss Properties for specialized outreach and mitigation activities.
- 6.2.8. Encourage public and private water conservation plans, including consideration of rainwater catchment system.
- 6.2.9. Inform the public of and/or encourage the purchase of flood and/or sewer back-up insurance.
- 6.2.10. Educate homeowners about flood insurance and ICC (Increased Cost of Compliance) coverage.
- o Objectives 6.3. Work with community partners to improve awareness of natural hazards.
 - 6.3.1. Partner with Parent Teacher Associations and local schools to implement existing curriculum related to natural hazards (e.g., Masters of Disaster, Risk Watch).
 - 6.3.2. Work with mobile home parks to identify and publicize nearby shelters for residents.
- o Objective 6.4. Use the media to increase awareness of natural hazards.
 - 6.4.1. Work with local media outlets to increase awareness of natural hazards. Implement seasonal hazard awareness weeks or days (e.g., hurricane preparedness week, winter weather awareness day).
 - 6.4.2. Work with the National Weather Service to promote the Turn Around, Don't Drown public education campaign.
- Goal 7: Promote hazard mitigation as a public value in recognition of its importance to the health, safety, and welfare of the population
 - o Objective 7.1. Undertake activities that recognize the importance of hazard mitigation as crucial to the long-term viability of the community.

- 7.1.1. Obtain official recognition of the Mitigation Advisory Committee (MAC) from the jurisdictions in the Planning District in order to help institutionalize and develop an ongoing mitigation program. Use the MAC to review mitigation projects and coordinate multi-jurisdictional grant applications.
- 7.1.2. Consider participating in the *StormReady* program sponsored by the National Weather Service.
- 7.1.3. Consider participating in FEMA's Community Rating System (CRS).

In formulating a mitigation strategy, a wide range of activities were considered in order to help achieve the goals and to lessen the vulnerability of the West Piedmont Planning District area to the effects of natural hazards.

Strategies were ranked by each community. Ranking was completed in order of relative priority based on the STAPLE/E criteria, as well as the strategy's potential to reduce vulnerability to natural hazards. Actions were given a ranking of high, medium or low, with the following meanings:

- High (H) implement in the short-term
- Medium (M) implement in the long-term
- Low (L) implement only as funding becomes available

When deciding on which strategies should receive priority in implementation, the communities considered:

- Time Can the strategy be implemented quickly?
- Ease to implement How easy is the strategy to implement? Will it require many financial or staff resources?
- Effectiveness Will the strategy be highly effective in reducing risk?
- Lifespan How long will the effects of the strategy be in place?
- Hazards Does the strategy address a high priority hazard or does it address multiple hazards?
- Post-disaster implementation Is this strategy easier to implement in a postdisaster environment?

In addition, the anticipated level of cost effectiveness of each measure was a primary consideration when developing mitigation actions. Because mitigation is an investment to reduce future damages, it is important to select measures for which the

reduced damages over the life of the measure are likely to be greater than the project cost. For structural measures, the level of cost effectiveness is primarily based on the likelihood of damages occurring in the future, the severity of the damages when they occur, and the level of effectiveness of the selected measure. Although detailed analysis was not conducted during the mitigation action development process, these factors were of primary concern when selecting measures. For those measures, that do not result in a quantifiable reduction of damages, such as public education an outreach, the relationship of the probable future benefits and the cost of each measure was considered when developing the mitigation actions.

The following matrix shows the strategies that each jurisdiction selected as appropriate for their community. Starred items indicate on-going activities. Items with double-stars indicate a joint strategy between a town and county or city and county. Check marks indicate unranked strategies.

Strategy	City of Danville	Franklin County	Henry County	City of Martinsville	Patrick County	Pittsylvania County
1.1.1. Increase flood warning capabilities, particularly as they relate to dam failure.	Н	√ *	Н	✓	Н	
1.1.2. Investigate, develop, or enhance Reverse 911 system or other public notification system. Investigate possible funding sources.	Н	√ *		✓	Н	Н
1.1.3. Establish flood level markers along bridges and other structures to indicate the rise of water levels along creeks and rivers in potential flood-prone areas. Work with VDOT and other jurisdictions as needed.		✓	M		Н	M
1.2.1. Investigate need for regional stormwater management plan.	Н				✓	
1.2.2. Include an assessment and associated mapping of the jurisdiction's vulnerability to location-specific hazards and make appropriate recommendations for the use of these hazard areas in a future Comprehensive Plan.	М	✓	M*	✓	✓	Н
1.2.3. Incorporate (or continue to incorporate) mitigation principles into	L	✓	М	✓	✓	Н

Strategy	City of Danville	Franklin County	Henry County	City of Martinsville	Patrick County	Pittsylvania County
local emergency management and recovery plans.						
1.2.4. Work with the Virginia Department of Forestry to review local zoning and subdivision ordinances to identify areas to include wildfire mitigation principles.		Н			✓	
1.2.5. Review and revise, if needed, local floodplain ordinances. Work with the state to coordinate a Community Assistance Visit to identify potential improvements or enhancements to existing floodplain management program.		✓		✓	✓	Н
1.2.6. Develop a new Zoning Ordinance or investigate revising the existing Zoning Ordinance to include separate zones or districts with appropriate development criteria for known hazard areas.		√				
1.2.7. Review and revise, if needed, existing Subdivision Ordinances to include hazard mitigation-related development criteria in order to regulate the location and construction of buildings and other		✓				

Strategy	City of Danville	Franklin County	Henry County	City of Martinsville	Patrick County	Pittsylvania County
infrastructure in known hazard areas.						
1.2.8. Investigate using non-conforming or substantial damage provisions to require hazard retrofitting of existing development.	L*					L
1.2.9. Evaluate the potential costs versus benefits of implementing a freeboard requirement for all new structures in the 100-year floodplain.		√	M		✓	
1.2.10. Integrate the jurisdiction's mitigation plan into current capital improvement plans to ensure that development does not encroach on known hazard areas.	M*	√ *	Н	√	✓	
1.2.11. Continue to enforce zoning and building codes to prevent/control construction within the floodplain.	L*	√ *	Н*	√ *	√ *	H*
1.3.1. Use fee simple and/or permanent easement to prevent development in the highest priority undeveloped floodplain (and/or wetlands) areas. Work with land trusts to purchase the land or conservation			L		√ *	L

Strategy	City of Danville	Franklin County	Henry County	City of Martinsville	Patrick County	Pittsylvania County
easements. Use these areas as public open space for passive recreational uses.						
1.3.2. Evaluate properties within the floodplain for possible relocation and/or buy-out. In particular, target FEMA's Repetitive Loss Properties throughout the West Piedmont Region for possible relocation and/or buy-out. Work with land trusts to facilitate purchase of land.	L		M*		✓	L
2.1.1. Investigate providing technical assistance for property owners to implement mitigation measures (i.e., strengthening building frame connections; elevating appliances, constructing a wind shelter).	М	✓	L/M	✓	✓	M
2.1.2. Identify existing flood-prone structures that may benefit from mitigation measures such as elevation or floodproofing techniques.	M	✓	Н			L
3.1.1. Incorporate hazard mitigation techniques into new community facilities to minimize damages.		√	M	√	√	M

Strategy	City of Danville	Franklin County	Henry County	City of Martinsville	Patrick County	Pittsylvania County
3.1.2. Investigate all primary and secondary schools to evaluate their resistance to all natural hazards. Prioritize the schools that are used as community shelters.		✓	M	Н	√	
3.1.3. Investigate critical community facilities, such as county administrative offices, shelters (non-school buildings), fire stations and police stations, to evaluate their resistance to flood and wind hazards. Prioritize facilities in known hazard areas (e.g., floodplains).	M	√ *	M	Н	✓	Н
3.2.1. Investigate all public utility lines to evaluate their resistance to flood, wind, and winter storm hazards.	Н	√ *	L	✓		
3.2.2. Initiate discussions with public/private utility companies to discuss incorporating mitigation measures into new and pre-existing development and infrastructure repairs. Options include: anchoring heavy equipment such as electrical transformers mounted on poles using additional straps and braces;	L	✓	L/M	√	✓	

Strategy	City of Danville	Franklin County	Henry County	City of Martinsville	Patrick County	Pittsylvania County
reducing camber in overhead transmission lines; and providing cover for exposed utilities.						
3.2.3. Implement a program to seal and vent or raise sewer system components (i.e. manhole covers that are located in the 100-year flood plain or other areas identified as highly probable for flooding).			M	✓		
3.3.1. Evaluate existing stormwater system to determine if it is adequate for existing (or future) flood hazards.	Н					
3.3.2. Identify program of corrective actions to improve stormwater systems' capacity to handle major rain events.	M					
3.3.3. Inspect and clear debris from stormwater drainage system. Encourage VDOT to execute this strategy if needed.	M*		M	Н		
3.3.4. Investigate, develop and/or implement a channel maintenance program consisting of routine inspections and subsequent debris removal to ensure free flow of water in local streams and	M*	Н	L	Н		L

Strategy	City of Danville	Franklin County	Henry County	City of Martinsville	Patrick County	Pittsylvania County
watercourses. Identify funding opportunities including partnering with local non-governmental or volunteer organization.						
3.4.1. Evaluate at-risk roads and implement mitigation measures (e.g., elevation, re-design.) Work with VDOT as needed.	M	✓	L/M		✓	
3.4.2. Identify funding opportunities to replace vulnerable or undersized culvert stream crossings with bridges or larger culverts to reduce flood hazards.	Н	✓	M/L			
4.1.1. Identify need for backup generators, communications, and/or vehicles at critical public facilities. Develop means to address shortfall identified.	M	Н	M	Н	H*	Н
4.1.2. Consider providing necessary electrical hook-up, wiring, and switches to allow readily accessible connections to emergency generators at key critical public facilities.	M	✓	H/M	Н	√ *	М

Strategy	City of Danville	Franklin County	Henry County	City of Martinsville	Patrick County	Pittsylvania County
4.2.1. Pursue upgrading of water systems to bring additional water sources on-line, to link community systems to provide redundancy, and to provide additional areas with non-well water.		✓			✓	M*
4.2.2. Identify and protect critical recharge zones in high risk areas.		✓				L
4.3.1. Initiate (or encourage) road clearing efforts early in wind and winter storms. Develop plan for quick deployment of road clearing equipment.	L*			√ *		
4.3.2. Work with VDOT, private utilities, and/or private homeowners to trim or remove trees that could down power lines and block roads.	M		L	✓	✓	
5.2.1. Identify training opportunities for staff to enhance their ability to use GIS for emergency management needs.	L	√ *	Н	✓	√	Н
5.2.2. Provide training opportunities to local zoning and building code enforcement staff. Educate them re:	L*	Н	Н	✓	Н	M

Strategy	City of Danville	Franklin County	Henry County	City of Martinsville	Patrick County	Pittsylvania County
damage assessment, mitigation techniques, and other related topics.						
5.2.3. Staff Emergency Management Office, Public Works, Building Inspections Office and/or Zoning Office at adequate levels.		Н	Н	√	Н	М
5.1.1. Develop Continuity of Operations plan.	М	Н	Н	✓		
5.1.2. Develop debris management plan.		✓	M	Н	✓	
5.1.3. Enhance the local emergency operations plan to better address emergency response to hazardous material spills.	M	✓	M	✓	√ *	
5.1.4. In the next update of hazard mitigation plan, include more detailed vulnerability assessments for manmade hazards based on FEMA and VDEM guidance.	M	√	L	✓	✓	М
5.2.4. Evaluate the floodplain manager's roles and responsibilities.		✓	Н	√	✓	

Strategy	City of Danville	Franklin County	Henry County	City of Martinsville	Patrick County	Pittsylvania County
5.3.1. Identify means to coordinate, collect and store damage assessment data in GIS format for each natural hazard event that causes death, injury and or property damage.	M	✓	M	✓	✓	H*
5.3.2. Link structure value data with tax parcel GIS database to increase accuracy of loss estimates.		√ *	H*		✓	Н
5.3.3. Coordinate with the state to update and digitize community Flood Insurance Rate Maps (FIRMs).	L	✓	L	✓	✓	Н
6.1.1. Educate landowners about need to maintain earthen and other privatelyowned dams.	L	✓	M		✓	M
6.1.2. Conduct emergency preparedness education campaign targeted at residents and business within dam inundation zones.	L	✓	L		✓	
6.1.3. Conduct public education on the principles of "sheltering in place."	L*	✓	M	Н	√	

Strategy	City of Danville	Franklin County	Henry County	City of Martinsville	Patrick County	Pittsylvania County
6.2.1. Distribute information packets to raise awareness regarding the risks present in the West Piedmont region and to provide disaster preparedness information.	L	✓	M*	Н	Н	М
6.2.2. Encourage purchase of and training on the use of NOAA radios. Provide NOAA weather radios to public facilities.		Н	Н	✓	Н	Н*
6.2.3. Work with local home improvement stores to provide workshops to residents on mitigation techniques.	M	✓	M	✓	✓	Н
6.2.4. Conduct/support workshop for contractors to help increase their understanding of how to construct buildings to meet and/or exceed current code requirements.	L*	✓			✓	М
6.2.5. Educate residents and business owners about reducing possible windborne debris (e.g., anchoring storage sheds, moving outdoor furniture indoors, trimming trees).		✓	L	✓	√	
6.2.6. Encourage residents to consider		✓	L*		√	

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Strategy	City of Danville	Franklin County	Henry County	City of Martinsville	Patrick County	Pittsylvania County
building a wind shelter as part of new construction or to retrofit existing buildings with wind shelters.						
6.2.7. Target FEMA's Repetitive Loss Properties for specialized outreach and mitigation activities.	M	✓	M		✓	L
6.2.8. Encourage public and private water conservation plans, including consideration of rainwater catchment systems.		✓			✓	
6.2.9. Inform the public of and/or encourage the purchase of flood and/or sewer back-up insurance.		✓	М	✓	√	
6.2.10. Educate homeowners about flood insurance and ICC (Increased Cost of Compliance) coverage.		✓	L		√	
6.3.1. Partner with Parent Teacher Associations and local schools to implement existing curriculum related to natural hazards (e.g., Masters of Disaster, Risk Watch).		✓	М	✓	√	M*

Strategy	City of Danville	Franklin County	Henry County	City of Martinsville	Patrick County	Pittsylvania County
6.3.2. Work with mobile home parks to identify and publicize nearby shelters for residents.		✓			✓	M
6.4.1. Work with local media outlets to increase awareness of natural hazards. Implement seasonal hazard awareness weeks or days (e.g., hurricane preparedness week, winter weather awareness day).	L*	✓	H/M	√ *	✓	H*
6.4.2. Work with the National Weather Service to promote the Turn Around, Don't Drown public education campaign.	L	✓	М	✓	✓	Н
7.1.1. Obtain official recognition of the mitigation working group/Mitigation Advisory Committee (MAC) from the jurisdictions in the Planning District in order to help institutionalize and develop an ongoing mitigation program. Use the MAC to review mitigation projects and coordinate multi-jurisdictional grant applications.	М	√	М/Н	✓	√	Н
7.1.2. Consider participating in the		Н	M	✓	✓	Н

Strategy	City of Danville	Franklin County	Henry County	City of Martinsville	Patrick County	Pittsylvania County
StormReady program sponsored by the National Weather Service.						
7.1.3. Consider participating in FEMA's Community Rating System (CRS).	М	✓	M		✓	М

Strategy	Town of Boones Mill	Town of Chatham	Town of Gretna	Town of Hurt	Town of Rocky Mount	Town of Ridgeway	Town of Stuart
1.1.1. Increase flood warning capabilities, particularly as they relate to dam failure.	✓		L				✓
1.1.2. Investigate, develop, or enhance Reverse 911 system or other public notification system (i.e., siren). Investigate possible funding sources.			M				
1.1.3. Establish flood level markers along bridges and other structures to indicate the rise of water levels along creeks and rivers in potential floodprone areas. Work with VDOT and other jurisdictions as needed.	✓			Н			✓

Strategy	Town of Boones Mill	Town of Chatham	Town of Gretna	Town of Hurt	Town of Rocky Mount	Town of Ridgeway	Town of Stuart
1.2.1. Investigate need for regional stormwater management plan.	✓				M		
1.2.2. Include an assessment and associated mapping of the jurisdiction's vulnerability to location-specific hazards and make appropriate recommendations for the use of these hazard areas in a future Comprehensive Plan.		L	Н	Н	L		
1.2.3. Incorporate (or continue to incorporate) mitigation principles into local emergency management and recovery plans.						H**	
1.2.5. Review and revise, if needed, local floodplain ordinances. Work with the state to coordinate a Community Assistance Visit to identify potential improvements or enhancements to existing floodplain management program.	✓						√
1.2.6. Develop a new Zoning					L		

Strategy	Town of Boones Mill	Town of Chatham	Town of Gretna	Town of Hurt	Town of Rocky Mount	Town of Ridgeway	Town of Stuart
Ordinance or investigate revising the existing Zoning Ordinance to include separate zones or districts with appropriate development criteria for known hazard areas.							
1.2.7. Review and revise, if needed, existing Subdivision Ordinances to include hazard mitigation-related development criteria in order to regulate the location and construction of buildings and other infrastructure in known hazard areas.					L		
1.2.9. Evaluate the potential costs versus benefits of implementing a freeboard requirement for all new structures in the 100-year floodplain.	√					L	√
1.2.10. Integrate the jurisdiction's mitigation plan into current capital improvement plans to ensure that development does not encroach on known hazard areas.	√		M		L	Н	✓

Strategy	Town of Boones Mill	Town of Chatham	Town of Gretna	Town of Hurt	Town of Rocky Mount	Town of Ridgeway	Town of Stuart
1.2.11. Continue to enforce zoning and building codes to prevent/control construction within the floodplain.	√	Н	Н		L	Н	√
1.2.12. Develop ordinances that regulate the placement of potentially hazardous critical facilities such as pipelines or high voltage transmission lines.			M				
1.3.1. Use fee simple and/or permanent easement to prevent development in the highest priority undeveloped floodplain (and/or wetlands) areas. Work with land trusts to purchase the land or conservation easements. Use these areas as public open space for passive recreational uses.	✓				L		
1.3.2. Evaluate properties within the floodplain for possible relocation and/or buy-out. In particular, target FEMA's Repetitive Loss Properties throughout the West Piedmont							√

Strategy	Town of Boones Mill	Town of Chatham	Town of Gretna	Town of Hurt	Town of Rocky Mount	Town of Ridgeway	Town of Stuart
Region for possible relocation and/or buy-out. Work with land trusts to facilitate purchase of land.							
2.1.1. Investigate providing technical assistance for property owners to implement mitigation measures (i.e., strengthening building frame connections; elevating appliances, constructing a wind shelter).	✓				Н	M	√
2.1.2. Identify existing flood-prone structures that may benefit from mitigation measures such as elevation or floodproofing techniques.	✓				L		Н
3.1.1. Incorporate hazard mitigation techniques into new community facilities to minimize damages.	✓	L	М	M	M	Н	√
3.1.2. Investigate all primary and secondary schools to evaluate their resistance to all natural hazards. Prioritize the schools that are used as community shelters.						H**	

Strategy	Town of Boones Mill	Town of Chatham	Town of Gretna	Town of Hurt	Town of Rocky Mount	Town of Ridgeway	Town of Stuart
3.1.3. Investigate critical community facilities, such as county administrative offices, shelters (nonschool buildings), fire stations and police stations, to evaluate their resistance to flood and wind hazards. Prioritize facilities in known hazard areas (e.g., floodplains).	✓				Н	H**	✓
3.2.1. Investigate all public utility lines to evaluate their resistance to flood, wind, and winter storm hazards.	✓		M		Н	H**	
3.2.2. Initiate discussions with public/private utility companies to discuss incorporating mitigation measures into new and pre-existing development and infrastructure repairs. Options include: anchoring heavy equipment such as electrical transformers mounted on poles using additional straps and braces; reducing camber in overhead transmission lines; and providing cover for exposed			M			H**	

Strategy	Town of Boones Mill	Town of Chatham	Town of Gretna	Town of Hurt	Town of Rocky Mount	Town of Ridgeway	Town of Stuart
utilities.							
3.2.3. Implement a program to seal and vent or raise sewer system components (i.e. manhole covers that are located in the 100-year flood plain or other areas identified as highly probable for flooding).	✓		Н		L		Н
3.3.3. Inspect and clear debris from stormwater drainage system. Encourage VDOT to execute this strategy if needed.						M	
3.3.4. Investigate, develop and/or implement a channel maintenance program consisting of routine inspections and subsequent debris removal to ensure free flow of water in local streams and watercourses. Identify funding opportunities including partnering with local nongovernmental or volunteer organization.	✓	M*	М			H**	

Strategy	Town of Boones Mill	Town of Chatham	Town of Gretna	Town of Hurt	Town of Rocky Mount	Town of Ridgeway	Town of Stuart
3.4.1. Evaluate at-risk roads and implement mitigation measures (e.g., elevation, re-design.) Work with VDOT as needed.	✓					M	
3.4.2. Identify funding opportunities to replace vulnerable or undersized culvert stream crossings with bridges or larger culverts to reduce flood hazards.	√	L		M			
4.1.1. Identify need for backup generators, communications, and/or vehicles at critical public facilities. Develop means to address shortfall identified.	√	L	Н	M	L	Н	Н
4.1.2. Consider providing necessary electrical hook-up, wiring, and switches to allow readily accessible connections to emergency generators at key critical public facilities.	√	М	Н	Н	М		Н
4.2.1. Pursue upgrading of water systems to bring additional water	✓		Н		H**	L	✓

Strategy	Town of Boones Mill	Town of Chatham	Town of Gretna	Town of Hurt	Town of Rocky Mount	Town of Ridgeway	Town of Stuart
sources on-line, to link community systems to provide redundancy, and to provide additional areas with non-well water.							
4.2.2. Identify and protect critical recharge zones in high risk areas.	✓		Н				
4.3.1. Initiate (or encourage) road clearing efforts early in wind and winter storms. Develop plan for quick deployment of road clearing equipment.					Н		
4.3.2. Work with VDOT, private utilities, and/or private homeowners to trim or remove trees that could down power lines and block roads.	✓					H**	√
5.1.1. Develop Continuity of Operations plan.	✓	L	Н		H**		
5.1.2. Develop debris management plan.	√						
5.1.3. Enhance the local emergency						H**	

Strategy	Town of Boones Mill	Town of Chatham	Town of Gretna	Town of Hurt	Town of Rocky Mount	Town of Ridgeway	Town of Stuart
operations plan to better address emergency response to hazardous material spills.							
5.1.4. In the next update of hazard mitigation plan, include more detailed vulnerability assessments for manmade hazards based on FEMA and VDEM guidance.	√	L	M	✓	Н	L	√
5.2.1. Identify training opportunities for staff to enhance their ability to use GIS for emergency management needs.					Н		√
5.2.2. Provide training opportunities to local zoning and building code enforcement staff. Educate them re: damage assessment, mitigation techniques, and other related topics.					H**	М	✓
5.2.3. Staff Emergency Management Office, Public Works, Building Inspections Office and/or Zoning Office at adequate levels.					L	M	√

Strategy	Town of Boones Mill	Town of Chatham	Town of Gretna	Town of Hurt	Town of Rocky Mount	Town of Ridgeway	Town of Stuart
5.2.4. Evaluate the floodplain manager's roles and responsibilities.	✓		L				✓
5.3.1. Identify means to coordinate, collect and store damage assessment data in GIS format for each natural hazard event that causes death, injury and or property damage.					M		√
5.3.2. Link structure value data with tax parcel GIS database to increase accuracy of loss estimates.	✓				M**		Н
5.3.3. Coordinate with the state to update and digitize community Flood Insurance Rate Maps (FIRMs).	√	L		√	M	М	√
6.1.1. Educate landowners about need to maintain earthen and other privately-owned dams.					L		√
6.1.2. Conduct emergency preparedness education campaign targeted at residents and business within dam inundation zones.		L			Н		√

Strategy	Town of Boones Mill	Town of Chatham	Town of Gretna	Town of Hurt	Town of Rocky Mount	Town of Ridgeway	Town of Stuart
6.1.3. Conduct public education on the principles of "sheltering in place."		L		✓	L	Н	
6.2.1. Distribute information packets to raise awareness regarding the risks present in the West Piedmont region and to provide disaster preparedness information.	√	L	Н	√	M	H*	✓
6.2.2. Encourage purchase of and training on the use of NOAA radios. Provide NOAA weather radios to public facilities.	√				M	Н	✓
6.2.3. Work with local home improvement stores to provide workshops to residents on mitigation techniques.					Н	M	✓
6.2.4. Conduct/support workshop for contractors to help increase their understanding of how to construct buildings to meet and/or exceed current code requirements.		-			Н	-	

Strategy	Town of Boones Mill	Town of Chatham	Town of Gretna	Town of Hurt	Town of Rocky Mount	Town of Ridgeway	Town of Stuart
6.2.5. Educate residents and business owners about reducing possible windborne debris (e.g., anchoring storage sheds, moving outdoor furniture indoors, trimming trees).		L		✓	Н	Н	✓
6.2.6. Encourage residents to consider building a wind shelter as part of new construction or to retrofit existing buildings with wind shelters.					M		√
6.2.7. Target FEMA's Repetitive Loss Properties for specialized outreach and mitigation activities.							✓
6.2.8. Encourage public and private water conservation plans, including consideration of rainwater catchment systems.	✓		Н				√
6.2.9. Inform the public of and/or encourage the purchase of flood and/or sewer back-up insurance.	√		M				
6.2.10. Educate homeowners about	✓		L		M		✓

Strategy	Town of Boones Mill	Town of Chatham	Town of Gretna	Town of Hurt	Town of Rocky Mount	Town of Ridgeway	Town of Stuart
flood insurance and ICC (Increased Cost of Compliance) coverage.							
6.3.1. Partner with Parent Teacher Associations and local schools to implement existing curriculum related to natural hazards (e.g., <i>Masters of Disaster, Risk Watch</i>).					M		
6.3.2. Work with mobile home parks to identify and publicize nearby shelters for residents.				M		Н	
6.4.1. Work with local media outlets to increase awareness of natural hazards. Implement seasonal hazard awareness weeks or days (e.g., hurricane preparedness week, winter weather awareness day).		M		√		Н	√
6.4.2. Work with the National Weather Service to promote the <i>Turn Around, Don't Drown</i> public education campaign.	✓	L		√	L		√

Strategy	Town of Boones Mill	Town of Chatham	Town of Gretna	Town of Hurt	Town of Rocky Mount	Town of Ridgeway	Town of Stuart
7.1.1. Obtain official recognition of the mitigation working group/Mitigation Advisory Committee (MAC) from the jurisdictions in the Planning District in order to help institutionalize and develop an ongoing mitigation program. Use the MAC to review mitigation projects and coordinate multi-jurisdictional grant applications.	✓	М	Н	Н	M	Н	Н
7.1.2. Consider participating in the <i>StormReady</i> program sponsored by the National Weather Service.	✓	L**	M	√ **	M**		~
7.1.3. Consider participating in FEMA's Community Rating System (CRS).	√				М	Н	√

Jurisdiction-specific Strategies

City of Danville

Evaluate need for replacement of culverts that run beneath buildings in the downtown area. Culverts are antiquated and are in danger of collapse, which could lead to both the collapse of the buildings above them and increased flood risk. (High priority)

Franklin County

- Secure water tanks and other components of water system from outside influences.
- Consider including mitigation measures as part of Indoor Plumbing and Rehabilitation program.

Patrick County

- Continue to maintain diversion channel on Mayo River.
- Monitor need to improve "culverts" running under structures in downtown area (e.g., plaza with Bengels and Tony's Pizza) and Nevermar.
- Consider increasing county's ability to provide first response to hazardous material spills.

Pittsylvania County

- Investigate including construction of safe rooms in rehabilitation of County high schools. (Low priority)
- Develop and distribute brochure to residents and business owners regarding need to trim trees near power lines. Encourage cooperation with VDOT and private utility companies. (Low priority)
- Undertake a study to determine causes of flooding on Route 29 and identify potential mitigation strategies. (Medium priority)
- Work with VDOT to identify and prioritize culverts and roads for flood mitigation measures. (Low priority)
- Work on ways to reduce vulnerability of people with disabilities. County Emergency Management has worked with local service groups, local colleges and City of Danville to provide public to people with disabilities. (High priority)

- Continue to implement the Community Emergency Response Team (CERT) program. (High priority)
- Work with the Chamber of Commerce to educate and prepare local business owners for natural disasters. (High priority)
- Consider establishing a local Voluntary Organizations Active in Disaster (VOAD) group. (Medium priority)
- Consider increasing local capacity to respond to hazardous materials incidents. (High priority)

Developing a Mitigation Action Plan

Mitigation action plans were developed for all of the regional activities and the high priority actions for each jurisdiction. The following action plans were designed to achieve the goals and objectives identified in this multi-jurisdictional all-hazards mitigation plan. Each proposed action includes:

- (1) the appropriate category for the mitigation technique (these categories are described in Appendix D),
- (2) the hazard it is designed to mitigate,
- (3) the objective(s) it is intended to help achieve,
- (4) general background information,
- (5) the priority level for its implementation (high, moderate, or low),
- (6) potential funding sources, if applicable,
- (7) the agency/person assigned responsibility for carrying out the strategy, and
- (8) a target completion date.

Regional Actions

The actions on the following pages can be undertaken as a regional effort. Together, these comprise a regional action plan. Regional actions were ranked by the MAC during their May 26, 2005, meeting. The committee used a multi-voting system to prioritize the regional actions. Each member present received six votes to distribute between the proposed actions.

The ranking criteria described in the previous section were used in ranking the regional actions.

Regional Strategies

Strategy 5.2.2. Provide training opportunities to local zoning and building code enforcement staff. Educate them re: damage assessment, mitigation techniques, and other related topics.

staff. Educate them re: damage assessment, mitigation techniques, and other related topics.		
Affected Jurisdictions	All	
Category	Local Capacity	
Hazard	All	
Objective(s) addressed	5.2	
	One key to successful enforcement of floodplain and other regulations is to ensure that staff are adequately trained and have the opportunity to learn about new standards and techniques. It is especially important that staff understand how damage assessments are conducted by state and federal officials. In addition, enforcement staff should be comfortable in making substantial damage determinations.	
Background	The limited number of staff at the county and town level makes it difficult to send people to extended, out-of-town training courses. Short courses (i.e., one day) should be identified that could be delivered in the West Piedmont region, potentially at a site identified by the PDC.	
	Potential class topics could include:	
	- Damage assessment	
	- Substantial damage requirements	
	- Floodproofing techniques	
	- Stormwater management	
Priority	High	
Funding sources	VDEM, FEMA HMGP	
Responsible party	Regional Emergency Managers Group; West Piedmont Planning District Commission; Planning/Zoning	
Completion date	On-going	

Strategy 6.2.3. Work with local home improvement stores to provide workshops to residents on mitigation techniques.

mitigation techniques.	
Affected Jurisdictions	All
Category	Public Information, Training and Preparedness
Hazard	All Hazards
Objective(s) addressed	6.2
	Many home improvement stores (i.e., Home Depot and Lowes) currently offer classes to customers on a variety of topics. Workshops on mitigation techniques for the home are an obvious follow-on to an already successful classroom process. Such mitigation workshops have been held successfully across the United States.
Background	Groups like the American Red Cross, Federal Emergency Management Agency Region 3, and the Virginia Department of Emergency Management may be available to jointly sponsor such workshops.
	More information can be found at: http://www.homedepot.com/HDUS/EN_US/corporate/ corp_respon/prepare_respond.shtml
Priority	High
Funding sources	N/A
Responsible party	Regional Emergency Managers Group; West Piedmont Planning District Commission; Building Inspections
Completion date	On-going

Strategy 5.2.1. Identify training opportunities for staff to enhance their ability to use GIS for emergency management needs.		
Affected Jurisdictions	All	
Category	Emergency Services	
Hazard	All hazards	
Objective(s) addressed	5.2	
Background	Emergency managers collect and manage a vast quantity of data before, during and after disasters. Much of this information comes from other departments and agencies and has a spatial component. Geographic Information Systems (GIS) provide a means to manage and share these datasets. Staff should continue to take opportunities to attend training to increase their knowledge of GIS and their application to emergency management.	
Priority	High	
Funding sources	Departmental funds, FEMA	
Responsible party	Regional Emergency Managers Group; West Piedmont Planning District Commission; Planning/Zoning	
Completion date	1st quarter of 2007	

Strategy 6.4.2. Work with the Roanoke office of the National Weather Service to promote the "Turn Around, Don't Drown" public education campaign.		
Affected Jurisdictions	All	
Category	Public Information and Awareness	
Hazard	Flood	
Objective(s) addressed	6.4	
	Flooding causes more deaths than any other severe weather related hazard. Many of the deaths occur in automobiles as they are swept away by floodwaters. The West Piedmont region has seen its share of driver and passenger fatalities.	
Background	The National Weather Service has developed a public education campaign, "Turn Around, Don't Drown," to educate drivers about the hazards flood waters pose.	
	A range of public education materials, such as brochures, signs, and Public Service Announcements, already have been developed by the National Weather Service for use by its local office and local government. Local jurisdictions should identify commonly flooded intersections and prioritize signage for these areas to inform drivers of the risks.	
Priority	Medium	
Funding sources	National Weather Service	
Responsible party	Regional Emergency Managers Group; West Piedmont Planning District Commission; County/City Public Information Officer	
Completion date	Six months after plan approval	

Strategy 6.4.1. Work with local media outlets to increase awareness of natural hazards. Implement seasonal hazard awareness weeks or days (e.g., hurricane preparedness week, winter weather awareness day).

weather awareness day).	
Affected Jurisdictions	All
Category	Public Information and Awareness
Hazard	All hazards
Objective(s) addressed	6.4
	A 2004 study sponsored by the American Red Cross and Wirthlin, a survey research firm, found that while Americans recognize the importance of being personally prepared for disaster, fewer than two in ten U.S. adults characterize themselves as very prepared.
Background	For people to take the steps to become prepared for disaster, they first must be aware of their risk. Media outlets (e.g., television, radio, print) can play an important role in raising awareness and encouraging personal responsibility to minimize the loss of life and property during a disaster.
	Public education campaigns can be tied to specific events (e.g., anniversary of a disaster) or to a particular hazard and time of year (e.g., tornado preparedness day in the late spring).
Priority	Medium
Funding sources	FEMA/HMGP 5% funds, VDEM, local government operating budgets, private sources
Responsible party	Regional Emergency Managers Group; West Piedmont Planning District Commission; County/City Public Information Officer
Completion date	On-going

Strategy 6.2.1. Distribute information packets to raise awareness regarding the risks present in the West Piedmont region and provide disaster preparedness information.

the West Piedmont region and provide disaster preparedness information.		
Affected Jurisdictions	All	
Category	Public Information and Awareness	
Hazard	All hazards	
Objective(s) addressed	6.2	
Background	The West Piedmont region is prone to winter storms, flooding and high winds. It is imperative that residents are informed of preparedness information on how to prepare for the impacts of natural hazards. In addition, it is important to remind the population of the area that may have become complacent about the hazards and how to prepare for them. Key messages include whom to call for information in the event of an impending disaster or after a disaster, what things to include in a disaster preparedness kit and simple hazard specific mitigation measures each resident can take to reduce their risk. Other topics may include: flood insurance (including Increased Cost of Compliance coverage); sewer back-up insurance; potential wind-borne debris; sheltering in place.	
Priority	Medium	
Funding sources	FEMA/Hazard Mitigation Grant Program (HMGP) 5% funds, business community sponsors	
Responsible party	Regional Emergency Managers Group; West Piedmont Planning District Commission; County/City Public Information Officer	
Completion date	On-going	

Strategy 5.3.3. Coordinate with the Maps (FIRMs).	ne state to update and digitize community Flood Insurance Rate
Affected Jurisdictions	All
Category	Public Information and Awareness, Local Capacity
Hazard	Flood
Objective(s) addressed	5.3
Background	Flood Insurance Rate Maps (FIRMs) are developed by FEMA after a detailed flood risk assessment. Maps for the West Piedmont region range from 4 to 27 years old and often no longer reflect the true flood risk to the area. In addition, the maps are not readily available in a digital format, complicating their effective use for planning and education purposes. Since these products are used by private citizens, insurance agents and brokers to locate properties/buildings and identify the risk for flood damage, it is crucial that they be accurate and up-to-date. The maps also are used by community officials to administer floodplain management regulations and mitigate flood damage. In addition, lending institutions and federal agencies use the FIRMS to determine when flood insurance is required for loans or grants involving the purchase or construction of buildings. The Mitigation Advisory Committee should work with state floodplain management officials to ensure the communities within the West Piedmont Planning District are prioritized when funds for updating flood maps become available.
Priority	Low
Funding sources	FEMA Map Modernization, CTP
Responsible party	Community floodplain manager, Mitigation Advisory Committee
Completion date	4 th quarter of 2008

Strategy 5.1.4. In the next update of hazard mitigation plan, include more detailed vulnerability assessments for manmade hazards based on FEMA and VDEM guidance.

variiciaointy assessinents for in	laninade nazards based on PEWA and VDEW guidance.
Affected Jurisdictions	All
Category	Local Capacity
Hazard	Manmade
Objective(s) addressed	5.1
Background	While natural hazards are the focus of the Disaster Mitigation Act of 2000, this plan includes a preliminary assessment of the vulnerability West Piedmont region to a range of manmade hazards. The assessment is descriptive in nature, in part because of data constraints and lack of guidance from FEMA on how regional manmade vulnerability assessments should be conducted. In the update to this plan, a more detailed vulnerability assessment for manmade hazards should be included if methodologies have been developed by FEMA and/or the Virginia Department of Emergency Management and supporting data is available.
Priority	Low
Funding sources	VDEM, FEMA, Department of Homeland Security
Responsible party	Regional Emergency Managers Group; West Piedmont Planning District Commission
Completion date	1st quarter of 2010

Strategy 2.1.1. Investigate providing technical assistance for property owners to implement mitigation measures (i.e., strengthening building frame connections; elevating appliances, constructing a wind shelter).

Affected Jurisdictions	All
Category	Property Protection; Public Information and Awareness
Hazard	Flood, Wind, Wildfire
Objective(s) addressed	2.1
Background	A variety of mitigation techniques can be undertaken by homeowners to improve the resistance of their properties to natural hazards. The Mitigation Advisory Committee could develop a program to provide one-on-one technical assistance to homeowners to teach them how to implement mitigation measures in their homes. This program could include working with City and County building departments to distribute copies of existing publications that contain information on how to strengthen and repair homes. Opportunities may exist to share staff and knowledge among jurisdictions.
Priority	Low
Funding sources	HMGP 5%, local funds
Responsible party	Regional Emergency Managers Group; West Piedmont Planning District Commission
Completion date	4 th quarter of 2008

Individual Actions

Each jurisdiction selected and prioritized mitigation strategies for their jurisdiction. The top five to seven strategies for each jurisdiction are described be more in more detail. These strategies, combined with the regional strategies above, comprise the action plan for each jurisdiction.

City of Danville

Strategy 3.2.1. Investigate all public utility lines to evaluate their resistance to flood, wind, and winter storm hazards.		
Affected Jurisdictions	City of Danville	
Category	Property Protection	
Hazard	Flood, wind, winter storm	
Objective(s) addressed	3.2	
Background	Public utility lines provide essential services to City residents. Many of the existing lines were installed many years ago and may be vulnerable to natural disasters. A comprehensive survey should be conducted to determine what, if any, portions of the lines and systems are vulnerable to natural disasters. The results of this survey can be used to create a schedule for replacement and/or hardening of the lines	
Priority	High	
Funding sources	City funds	
Responsible party	Public Utilities	
Completion date	2 nd quarter of 2007	

Strategy 3.3.1. Evaluate existing stormwater system to determine if it is adequate for existing (or future) flood hazards.

future) flood hazards.	
Affected Jurisdictions	City of Danville
Category	Prevention
Hazard	Flood
Objective(s) addressed	3.3
Background	Stormwater systems are used to hold back stormwater runoff to control flooding and settle out pollutants and debris, thereby improving water quality. The systems have many elements including catch basins, manholes, pipes, drywells, and detention systems. A stormwater system is designed for a certain capacity based on the projected runoff. As communities grow, the amount of runoff may increase and eventually exceed the amount that the system was designed to handle. Additional capacity may be needed to handle the increased runoff.
Priority	High
Funding sources	Capital Improvements Program
Responsible party	Public Works
Completion date	2 nd quarter of 2007

Strategy 1.2.1. Investigate need for regional stormwater management plan.	
Affected Jurisdictions	City of Danville
Category	Prevention
Hazard	Flood
Objective(s) addressed	1.2
Background	The City of Danville's Comprehensive Plan recognizes that stormwater poses a major problem for the city. The problem is particularly acute for older neighborhoods where the drainage system is antiquated.
	The plan suggests that a comprehensive stormwater management plan be developed including improved drainage solutions for older neighborhoods that experience flooding. Projects could be supported through the Capital Improvements Plan.
	A regional stormwater management plan addresses stormwater-related water quality and water quantity impacts of new and existing land uses in a drainage area, and is developed on a drainage area basis, and is not limited to onsite stormwater management measures.
	A regional stormwater management approach would require the City to work with the County on identifying the impacts of development on water quality and quantity and to determine ways to minimize these impacts. VDOT also will need to be involved in the planning effort. The plan also could help meet stormwater pollution control goals under EPA's National Pollutant Discharge Elimination System.
Priority	High
Funding sources	U.S. EPA; USDA/NRCS [Watershed Surveys and Planning]; Army Corps of Engineers/Section 22 Planning Assistance to States (PAS); Army Corps of Engineers/Flood Plain Management Services (FPMS)]
Responsible party	Planning, Public Works

Completion date	4 th quarter of 2007
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Strategy 3.4.2. Identify funding opportunities to replace vulnerable or undersized culvert stream crossings with bridges or larger culverts to reduce flood hazards.

crossings with bridges or larger culverts to reduce flood nazards.	
Affected Jurisdictions	City of Danville
Category	Structural Projects
Hazard	Flood
Objective(s) addressed	3.4
Background	The parts of roads that cross water bodies, such as streams, can be particularly vulnerable to flooding. Numerous roads in the City use culvert-style crossings to span small streams. If these culverts are too small to handle floodwaters or become clogged with debris, flooding of the road can result. Arnett Boulevard along Apple Branch is of particular concern. The drainage culvert makes a turn in this area, reducing its capacity. The culvert often overflows causing flooding in adjacent buildings.
Priority	High
Funding sources	FEMA, VDOT
Responsible party	Public Works
Completion date	4 th quarter of 2009

Strategy 1.1.1. Increase flood warning capabilities, particularly as they relate to dam failure.	
Affected Jurisdictions	City of Danville
Category	Emergency Services
Hazard	Flood
Objective(s) addressed	1.1
Background	The City of Danville has six dams within its limits. Three of these dams would have a high impact if they were to fail. In addition, the rivers that flow through Danville are subject to flooding due to high rainfall or other natural events.
	The Integrated Flood Observation and Warning System (I-FLOWS) is one method to improve flood warning. I-FLOWS relies on radio reporting rain and stream gauges which provide rainfall and stream level data via radio and satellite to counties, the state and the National Weather Service (NWS).
	Actual rainfall is compared with NWS Flash Flood Guidance (FFG), and alarms are triggered at various preset levels related to the FFG. The I-FLOWS computers at the county and all sites on the satellite network alarm with both an audible and a visual signal when rainfall or stream levels reach levels that can lead to flash flooding.
Priority	High
Funding sources	National Resource Conservation Service; FEMA Dam Safety Program; NWS
Responsible party	Public Works; VA DCR; NWS; local watershed organizations
Completion date	4 th quarter of 2007

Strategy 1.1.2. Investigate, develop, or enhance Reverse 911 system or other public notification system. Investigate possible funding sources.

system. Investigate possible funding sources.	
Affected Jurisdictions	City of Danville
Category	Emergency Services, Public Information
Hazard	All hazards
Objective(s) addressed	1.1
Background	Reverse 911 systems have a variety of functions including the ability to provide public warning during emergency events. This information can be targeted to a particular geographic area or to people with common characteristics (e.g., Community Emergency Response Team members). Some systems also allow you to provide text messages to pagers and other wireless devices. This system greatly increases a community's ability to quickly and efficiently provide warnings to its citizens. Information can be delivered in a variety of languages and means. Other mass notification options include low-power FM or AM radio stations, Internet-based warning systems, and ondemand text or voice notification systems.
Priority	High
Funding sources	Homeland Security Grant Program
Responsible party	Public Safety
Completion date	1st quarter of 2007

Strategy 2.1.*. Evaluate need for replacement of culverts that run beneath buildings in the downtown area.	
Affected Jurisdictions	City of Danville
Category	Structural Projects; Property Protection
Hazard	Flood; Subsidence
Objective(s) addressed	2.1
Background	Danville was founded in the late 1700s. A great deal of the City's downtown area was built in the mid-1800s. Running underneath these historic buildings are culverts, which are antiquated and in danger of collapse. Collapse of these culverts could lead to both the collapse of the buildings above them and increased flood risk.
Priority	High
Funding sources	PDM; HMGP; CIP
Responsible party	Public Works

 $3^{\rm rd}$ quarter of 2008

Completion date

Franklin County

Strategy 6.2.2. Encourage purchase of and training on the use of NOAA radios. P	Provide NOAA
weather radios to public facilities.	

weather radios to public facilities.	
Affected Jurisdictions	Franklin County
Category	Public Information and Awareness
Hazard	All
Objective(s) addressed	6.2
Background	NOAA Weather Radio (NWR) continuously broadcasts National Weather Service forecasts, warnings and other crucial weather information. The radios can be programmed to receive information specific to a certain area, using the Specific Area Message Encoder (SAME) feature, and can sound an alarm to alert users of approaching dangerous weather.
	NWR now broadcasts warning and post-event information for all types of hazards, both natural (such as earthquakes and volcano activity) and technological (such as chemical releases or oil spills).
	NWR receivers can be purchased at many retail stores that sell electronic merchandise. Prices can vary from \$20 to \$200, depending on the model. Many receivers have an alarm feature, but some may not. Users should be trained how to use the receivers. In particular, users should learn how to set alerts specific to their area.
Priority	High
Funding sources	National Weather Service (NWS), county budget
Responsible party	Public Safety
Completion date	July 1, 2006

Strategy 7.1.2. Consider participal Weather Service.	ating in the <i>StormReady</i> program sponsored by the National
Affected Jurisdictions	Franklin County
Category	Public Information; Emergency Services
Hazard	All
Objective(s) addressed	7.2
	StormReady is a nationwide community preparedness program that uses a grassroots approach to help communities develop plans to handle all types of severe weather.
	The program has several requirements based on the size of the participating community. The requirements for a community the size of Franklin County are:
	Established 24 hr Warning Point (WP)
	Establish Emergency Operations Center (EOC)
Background	• Four (4) ways for EOC/WP to receive NWS warning, etc.
	Four (4) ways to monitor hydrometerological data
	Four (4) ways for EOC/WP to disseminate warnings
	Placing NWR-SAME receivers in public facilities
	Four (4) annual weather safety talks
	Train spotters and dispatchers biennially
	Host/co-host annual NWS spotter training
	Formal hazardous weather operations plan
	Biennial visits by emergency manager to NWS
	Annual visits by NWS official to community
Priority	High
Funding sources	N/A
Responsible party	Public Safety
Completion date	July 2006

Strategy 5.2.2. Provide training opportunities to local zoning and building code enforcement staff. Educate them re: damage assessment, mitigation techniques, and other related topics.

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Affected Jurisdictions	Franklin County
Category	Local Capacity
Hazard	All
Objective(s) addressed	5.2
Background	One key to successful enforcement of floodplain and other regulations is to ensure that staff are adequately trained and have the opportunity to learn about new standards and techniques. It is especially important that staff understand how damage assessments are conducted by state and federal officials. In addition, enforcement staff should be comfortable in making substantial damage determinations. Potential class topics could include: - Damage assessment - Substantial damage requirements - Floodproofing techniques
Priority	High
Funding sources	General fund; VDEM (minor funding needed)
Responsible party	Public Safety
Completion date	December 2005

Strategy 5.2.3. Staff Emergency Management Office, Public Works, Building Inspections Office and Zoning Office at adequate levels.

Affected Jurisdictions	Franklin County
Category	N/A
Hazard	All hazards
Objective(s) addressed	5.2
Background	These offices have limited staff. Existing staff have multiple roles and responsibilities. The limited amount of staff affects ability to fully enforce existing regulations and to implement new programs. Additional staff is required. When an emergency occurs, staff quickly become overextended and may be unable to fulfill all duties from normal roles and emergency roles.
Priority	High
Funding sources	County budget
Responsible party	Board of Supervisors; Department heads
Completion date	4 th quarter of 2006

Strategy 3.3.4. Investigate, develop and/or implement a channel maintenance program consisting of routine inspections and subsequent debris removal to ensure free flow of water in local streams and watercourses. Identify funding opportunities including partnering with local nongovernmental or volunteer organization.

Affected Jurisdictions	Franklin County; Town of Boones Mill
Category	Structural Project
Hazard	Flood
Objective(s) addressed	3.3
	Waterways should be cleared of debris to allow for the free flow of water during a flood event. If streams or rivers are clogged with debris, damming could occur. As a result, areas upstream and adjacent to the unintended dam can receive unanticipated higher flood levels. In addition, downstream areas may be vulnerable to higher flooding if and when the dam breaks.
Background	Maggodee Creek often floods the Town of Boones Mill and Route 220 (north of the town). Of particular concern is the portion of the creek between the Route 220 bridge and the railroad bridge. In order to reduce the flooding, it may require channel clearing or channel modification. The County and Town will work with Blue Ridge Soil and Water Conservation District to determine the most effective means of reducing the flood.
Priority	High
Funding sources	Grants
Responsible party	Public Safety, Boones Mill town manager, Planning and Zoning and VDOT
Completion date	Estimated start date summer 2006

Strategy 4.1.1. Identify need for backup generators, communications, and/or vehicles at critical public facilities. Develop means to address shortfall identified.

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Affected Jurisdictions	Franklin County
Category	Emergency Services
Hazard	All
Objective(s) addressed	4.1
Background	Weather conditions throughout the year can cause unexpected power outages that affect critical public facilities. These outages can happen during thunder storms, hurricanes, winter storms and other events.
	Generators are essential to providing reliable, immediate and full-strength power when primary power systems fail. Standby power is required by health care facilities, operations centers, food storage, essential building operations, correctional and security systems, water pumping stations, and 911 call centers.
	Generator hook-ups allow the county to have a supply of mobile generators that can be assigned based on needs (as opposed to buying a generator for each facility). In addition, this ensures that if a generator is sent somewhere it can actually be used because it can be hooked-up.
Priority	High
Funding sources	CIP; FEMA PDM
Responsible party	Public Safety; General Properties
Completion date	July 2007

Strategy 5.1.1. Develop Continuity of Operations plan.	
Affected Jurisdictions	Franklin County
Category	Emergency Services
Hazard	All Hazards
Objective(s) addressed	5.1
Background	The ability of state and local governments to carry out their executive, legislative and judicial functions effectively and efficiently during or following a disaster or emergency is dependent on sound preparedness and planning. The development and maintenance of a viable Continuity of Operations Plan (COOP) and capability at each level of government is critical to save lives and protect the public health and well-being, protect property and preserve assets, maintain functionality, and maintain essential government operations and services.
	Franklin County does not have a Continuity of Operations Plan. This plan can be developed as a stand alone product and integrated into the next rewriting of the County's Emergency Operations Plan.
	The County may want to consider establishing a steering committee to facilitate development of the plan. Once the plan is written, it should be validated with a series of exercises.
Priority	High
Funding sources	Departmental budget.
Responsible party	Franklin County Department of Emergency Management
Completion date	2 nd quarter of 2006

Strategy 1.2.4. Work with the Virginia Department of Forestry (VDOF) to review local zoning and subdivision ordinances to identify areas to include wildfire mitigation principles.

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Affected Jurisdictions	Franklin County
Category	Prevention
Hazard	Wildfire
Objective(s) addressed	1.2
	Zoning and subdivision ordinances are some of the most important tools that local governments can use in determing where and what type of development should occur in their community.
Background	The Virginia Department of Forestry, as part of the FIREWISE program, has developed model ordinances that communities can adopt to reduce their risk to wildfires.
	The department will conduct a review of existing local zoning and subdivision ordinances to identify areas where wildfire mitigation principles could be incorporated. The review does not obligate the County to adopt the recommendations but rather gives the County an opportunity to have a wildfire mitigation expert provide feedback on existing regulations.
Priority	High
Funding sources	VDOF
Responsible party	Public Safety, VDOF
Completion date	Spring 2007

Henry County

Strategy 1.1.1. Increase flood warning capabilities, particularly as they relate to dam failure.	
Affected Jurisdictions	Henry County
Category	Emergency Services
Hazard	Flood
Objective(s) addressed	1.1
Background	The Integrated Flood Observation and Warning System (I-FLOWS) is one method to improve flood warning. I-FLOWS relies on radio reporting rain and stream gauges which provide rainfall and stream level data via radio and satellite to counties, the state and the National Weather Service (NWS).
	Actual rainfall is compared with NWS Flash Flood Guidance (FFG), and alarms are triggered at various preset levels related to the FFG. The I-FLOWS computers at the county and all sites on the satellite network alarm with both an audible and a visual signal when rainfall or stream levels reach levels that can lead to flash flooding.
	Henry County has determined that additional I-FLOWS gauges are needed to provide adequate coverage across the county.
Priority	High
Funding sources	National Resource Conservation Service; FEMA Dam Safety Program; NWS
Responsible party	Public Works; VA DCR; NWS; local watershed organizations
Completion date	4 th quarter of 2007

Strategy 5.3.2. Link structure value data with tax parcel GIS database to increase accuracy of loss estimates.

estimates.	
Affected Jurisdictions	Henry County
Category	N/A
Hazard	All
Objective(s) addressed	5.3
Background	Loss estimates in this mitigation plan are based on best available data. Oftentimes, the best available data is based on Census estimates at a county level. While this aggregate data provides the ability to perform a broad loss estimate, data improvements can be made. By linking structure value data (e.g., assessed value, replacement value) to parcel or structure footprint data, it would be possible to increase the accuracy of loss estimates. The increased accuracy would provide better information on where to make investments in future mitigation actions.
Priority	High
Funding sources	County funds
Responsible party	Planning; Tax Assessor; Emergency Management
Completion date	4 th quarter of 2006

$\textbf{Strategy 1.2.11.} \ Continue \ to \ enforce \ zoning \ and \ building \ codes \ to \ prevent/control \ construction \ within \ the \ floodplain.$

within the floodplain.	
Affected Jurisdictions	Henry County
Category	Prevention
Hazard	Flood
Objective(s) addressed	1.2
Background	Zoning and building codes are powerful tools used to ensure that development does not occur in hazardous areas and that development is built safely. However, these regulations are only as good as they are implemented.
	A lack of enforcement of zoning regulations and building inspections is believed to have contributed to the extensive destruction caused by Hurricane Andrew in 1992.
	Enforcement of zoning and building codes is essential to maintain eligibility for future grants and other financial assistance. In addition, enforcement of the building code contributes to the Building Code Effectiveness Grading Schedule, conducted by the Insurance Services Organization. The score received on this schedule ultimately affects the personal insurance rates in a community.
Priority	High
Funding sources	County budget
Responsible party	Planning and Community Development
Completion date	On-going

Strategy 5.2.4. Evaluate the floodplain manager's roles and responsibilities.	
Affected Jurisdictions	Henry County
Category	N/A
Hazard	Flood
Objective(s) addressed	5.2
Background	The primary responsibility of a local floodplain administrator is to interpret, administer and implement the regulatory requirements of a jurisdiction's floodplain management ordinance. A local floodplain ordinance is required to meet the minimum requirements of the National Flood Insurance Program (NFIP) as set forth in 44CFR Part 60. A local floodplain manager's duties can include: • Working with residents and property owners to assure that new development and substantial improvements to existing development are undertaken in a manner that minimizes or eliminates future impacts from floods, • Working with other governmental departments within the jurisdiction to assure that activities conducted by their personnel do not violate the provisions of the local floodplain management ordinance, and • Conducting workshops to educate residents, property owners and the public-at-large about the flood risk in the community and how to effectively and legally avoid said risk. A floodplain manager is given the responsibility to protect lives and property through the effective administration of the regulatory requirements in the local ordinance. By doing so, the floodplain manager plays a key role in assuring the long-term sustainability of the community and the natural environment contained therein.
Priority	High
Funding sources	County funds
Responsible party	Planning

Completion date	4 th quarter of 2005
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Strategy 6.2.2. Encourage purchase of NOAA radios. Provide NOAA weather radios to public facilities.	
Affected Jurisdictions	Henry County
Category	Public Information and Awareness
Hazard	All
Objective(s) addressed	6.2
Background	NOAA Weather Radio (NWR) continuously broadcasts National Weather Service forecasts, warnings and other crucial weather information. The radios can be programmed to receive information specific to a certain area, using the Specific Area Message Encoder (SAME) feature, and can sound an alarm to alert users of approaching dangerous weather.
	NWR now broadcasts warning and post-event information for all types of hazards, both natural (such as earthquakes and volcano activity) and technological (such as chemical releases or oil spills).
	NWR receivers can be purchased at many retail stores that sell electronic merchandise. Prices can vary from \$20 to \$200, depending on the model. Many receivers have an alarm feature, but some may not. Users should be trained how to use the receivers. In particular, users should learn how to set alerts specific to their area.
Priority	High
Funding sources	National Weather Service (NWS), county budget
Responsible party	Emergency Management
Completion date	July 1, 2006

Strategy 6.4.1. Work with local media outlets to increase awareness of natural hazards. Implement seasonal hazard awareness weeks or days (e.g., hurricane preparedness week, winter weather awareness day).

weather awareness day).	
Affected Jurisdictions	Henry County
Category	Public Information and Awareness
Hazard	All Hazards
Objective(s) addressed	6.4
Background	A 2004 study sponsored by the American Red Cross and Wirthlin, a survey research firm, found that while Americans recognize the importance of being personally prepared for disaster, fewer than two in ten U.S. adults characterize themselves as very prepared. For people to take the steps to become prepared for disaster,
	they first must be aware of their risk. Media outlets (e.g., television, radio, print) can play an important role in raising awareness and encouraging personal responsibility to minimize the loss of life and property during a disaster.
	Public education campaigns can be tied to specific events (e.g., anniversary of a disaster) or to a particular hazard and time of year (e.g., hurricane preparedness week in the early summer).
Priority	High
Funding sources	FEMA/HMGP 5% funds, VDEM, local government operating budgets, private sources
Responsible party	County Public Information Officer; Emergency Management
Completion date	On-going

City of Martinsville

Strategy : Protect City's facilities to ensure continued functionality after disaster. (combination of 3.1.2., 3.1.3., 4.1.1., 4.1.2.)	
Affected Jurisdictions	City of Martinsville
Category	Emergency Services
Hazard	All
Objective(s) addressed	3.1, 4.1
Background	A large generator placed on the City Hall Complex would supply emergency power to critical services such as City Administration, Police, Fire, and the Jail. The Middle School is the city's designated Emergency Shelter and therefore is in need of emergency power. We need to install equipment to easily connect a mobile generator to our Raw Water Pumping Station. As we move from our current contract with Synergy for electricity into the future we will be faced again with issue of peak demand. This in itself makes the idea of emergency generators easier to justify due to the ability to use them for peak shaving. It is estimated that a unit large enough to supply the City Hall Complex could cost \$400K - \$500K.
Priority	High
Funding sources	Capital Improvements Program, PDM, FEMA HMGP 5% funds
Responsible party	Electric Department
Completion date	Contingent on funds

Strategy: Address stormwater drainage issues. Consider increasing capacity of drainage pipes at Bridge Street. (Combination of 3.3.3, 3.3.4 and continue to maintain existing stormwater system and provide adequate capacity to handle stormwater).

Affected Jurisdictions	City of Martinsville
Category	Structural Projects
Hazard	Flood
Objective(s) addressed	3.3.
Background	The focus of improvements is the area from the Rt. 221 Bridge Street to where Doe Run Creek crosses under Memorial Blvd. near Lavinder St. Some plans are already in motion to correct part of this problem area as local funds allow. As additional funding becomes available additional phases of the project would be addressed.
Priority	High
Funding sources	City CIP
Responsible party	Public Works Department
Completion date	4 th quarter of 2009

Strategy 5.1.2. Develop debris management plan.	
Affected Jurisdictions	City of Martinsville
Category	Emergency Services
Hazard	Wind, winter storm, flood
Objective(s) addressed	5.1
Background	Wind and winter storms can cause tremendous amounts of downed trees or building damage. The debris from these events can be overwhelming to remove and dispose of for a municipality.
	The quantity and type of debris generated, its location, and the size of the area over which it is dispersed directly impacts the type of collection and disposal methods used to address the debris problem, associated costs incurred, and the speed with which the problem can be addressed. The City may have difficulty in locating staff, equipment, and funds to devote to debris removal, in the short as well as long term.
	The process for developing a debris management plan includes estimating debris amounts, preparing guidance to local governments on debris removal and disposal, contracting issues, temporary disposal sites, household hazardous waste disposal, contract monitoring, and reduction and disposal strategies.
	The City of Martinsville is scheduled to close its landfill this year and begin using a transfer station. Debris management will become a critical issue in the near future.
Priority	High
Funding sources	Homeland Security Grant Program
Responsible party	Public Works; Emergency Management
Completion date	As funding allows (critical need after January 2006)

Strategy : Educate the public about "sheltering in place" and other preparedness issues. (combination of 6.2.1. and 6.1.3.)	
Affected Jurisdictions	City of Martinsville
Category	Public Information
Hazard	Inorganic/Organic Spills
Objective(s) addressed	6.1, 6.2
Background	With a railroad passing through Martinsville in close proximity to residential areas, the possibility of a derailment that could require residents to "shelter in place" is high. "Sheltering in place" means to make a shelter out of the place you are in. Depending on the type of material released, leaving the area might take too long or place people in harm's way; in such cases, it may be safer for people to stay indoors than to go outside.
	The public needs to be educated about the benefits and practice of "sheltering in place." Other key preparedness messages include whom to call for information in the event of an impending disaster or after a disaster, how to develop a family emergency plan, and what things to include in a disaster preparedness kit.
Priority	High
Funding sources	FEMA/Hazard Mitigation Grant Program (HMGP) 5% funds
Responsible party	Emergency Management
Completion date	On-going

Patrick County

Strategy 1.1.3. Establish flood level markers along bridges and other structures to indicate the rise of water levels along creeks and rivers in potential flood-prone areas. Work with VDOT and other jurisdictions as needed.

Affected Jurisdictions	Patrick County
Category	Public Awareness and Information
Hazard	Flood
Objective(s) addressed	1.1
Background	Many of the deaths that occur during flood events occur when people attempt to drive through floodwaters. Roads subject to flooding should be clearly marked with a gauge showing flood depths. The gauge should be visible to drivers to alert them to the flood conditions and depth of water on the road. There are several sections of roads in the County that are subject to localized flooding during heavy rains. <i>Particular areas include:</i> (to be added by County)
Priority	High
Funding sources	HMGP, VDOT, County funds
Responsible party	Public Works
Completion date	4 th quarter of 2006

Strategy 1.1.1. Increase flood warning capabilities, particularly as they relate to dam failure.	
Affected Jurisdictions	Patrick County
Category	Emergency Services
Hazard	Flood
Objective(s) addressed	1.1
Background	The Integrated Flood Observation and Warning System (I-FLOWS) is one method to improve flood warning. I-FLOWS relies on radio reporting rain and stream gauges which provide rainfall and stream level data via radio and satellite to counties, the state and the National Weather Service (NWS).
	Actual rainfall is compared with NWS Flash Flood Guidance (FFG), and alarms are triggered at various preset levels related to the FFG. The I-FLOWS computers at the county and all sites on the satellite network alarm with both an audible and a visual signal when rainfall or stream levels reach levels that can lead to flash flooding.
	Patrick County has identified a need for additional rain and stream I-FLOWS gauges, particularly along the ridgeline in western portion of the County. In addition, the County needs the proper equipment to access information automatically (e.g., notification of impending flood conditions). The County has limited staff so it needs to be able to access information in the most efficient manner possible in order to respond efficiently.
Priority	High
Funding sources	United States Geological Survey (USGS); National Resource Conservation Service
Responsible party	Public Works; VA DCR; National Weather Service; USGS; local watershed organizations
Completion date	4 th quarter of 2007

Strategy 4.1.1. Identify need for backup generators, communications, and/or vehicles at critical public facilities. Develop means to address shortfall identified.

public facilities. Develop illeans to address shortian identified.	
Affected Jurisdictions	Patrick County
Category	Emergency Services
Hazard	All hazards
Objective(s) addressed	4.1
Background	The ability to recover quickly after a disaster rests, in part, on the community's ability to maintain critical functions during response and recovery. An important part of maintaining these critical functions is ensuring that the facilities and resources required are available after a disaster. An inventory and assessment should be completed for community critical facilities (e.g., Emergency Operations Center, Emergency Communications Center, public shelters) that examines the need for backup generators, communications and/or vehicles. Needs should be ranked and a plan developed to address the most critical needs first.
Priority	High
Funding sources	Capital Improvements Program, PDM, FEMA HMGP 5% funds
Responsible party	County Administrator
Completion date	2 nd quarter of 2006

Strategy 1.1.2. Investigate, develop, or enhance Reverse 911 system or other public notification system. Investigate possible funding sources.

system. Threstigate possible funding sources.	
Affected Jurisdictions	Patrick County
Category	Emergency Services, Public Information
Hazard	All hazards
Objective(s) addressed	1.1
Background	Reverse 911 systems have a variety of functions including the ability to provide public warning during emergency events. This information can be targeted to a particular geographic area or to people with common characteristics (e.g., Community Emergency Response Team members). Some systems also allow you to provide text messages to pagers and other wireless devices.
	This system greatly increases a community's ability to quickly and efficiently provide warnings to its citizens. Information can be delivered in a variety of languages and means.
	Other mass notification options include low-power FM or AM radio stations, Internet-based warning systems, and ondemand text or voice notification systems.
	Of particular concern are the homes near the Talbott Dam. These homes likely will not be able to hear the existing dam alert because of the distance from the alert siren. A Reverse 911 system is essential to reaching residents in a timely fashion.
Priority	High
Funding sources	Homeland Security Grant Program
Responsible party	Public Safety
Completion date	1st quarter of 2007

Strategy 6.2.2. Encourage purchase of NOAA radios. Provide NOAA weather radios to public facilities.	
Affected Jurisdictions	Patrick County
Category	Public Information and Awareness
Hazard	All
Objective(s) addressed	6.2
Background	NOAA Weather Radio (NWR) continuously broadcasts National Weather Service forecasts, warnings and other crucial weather information. The radios can be programmed to receive information specific to a certain area, using the Specific Area Message Encoder (SAME) feature, and can sound an alarm to alert users of approaching dangerous weather.
	NWR now broadcasts warning and post-event information for all types of hazards, both natural (such as earthquakes and volcano activity) and technological (such as chemical releases or oil spills).
	NWR receivers can be purchased at many retail stores that sell electronic merchandise. Prices can vary from \$20 to \$200, depending on the model. Many receivers have an alarm feature, but some may not. Users should be trained how to use the receivers. In particular, users should learn how to set alerts specific to their area.
Priority	High
Funding sources	National Weather Service (NWS), county budget
Responsible party	Emergency Management
Completion date	July 1, 2006

Pittsylvania County

Strategy 7.1.1. Obtain official recognition of the mitigation working group/Mitigation Advisory Committee (MAC) from the jurisdictions in the Planning District in order to help institutionalize and develop an ongoing mitigation program. Use the MAC to review mitigation projects and coordinate multi-jurisdictional grant applications.

	0 11
Affected Jurisdictions	Pittsylvania County
Category	N/A
Hazard	All Hazards
Objective(s) addressed	7.1
	The Disaster Mitigation Act of 2000 (DMA2K) required local governments to develop and to adopt all hazard mitigation plans to be eligible for certain types of future disaster assistance including funds for mitigation activities.
	The West Piedmont Planning District Commission formed a multi-jurisdictional committee to oversee hazard mitigation planning efforts for the West Piedmont Region. Each of the participating jurisdictions was represented on the committee.
Background	One way to increase the effectiveness of such committees and ensure long-term plan implementation is to bestow official status to them. In addition, a formalized committee will allow communities to share the workload when implementing regional activities.
	The region intends to utilize the Regional Emergency Mangers Group as the core of a working group coordinated by the West Piedmont Planning District Commission (see Section VIII for further details).
Priority	High
Funding sources	N/A
Responsible party	Board of Supervisors
Completion date	Immediately following plan approval

Strategy 5.3.2. Link structure value data with tax parcel GIS database to increase accuracy of loss estimates.

of 1035 estimates.	
Affected Jurisdictions	Pittsylvania County
Category	N/A
Hazard	All
Objective(s) addressed	5.3
Background	Loss estimates in this mitigation plan are based on best available data. Oftentimes, the best available data is based on Census estimates at a county level. While this aggregate data provides the ability to perform a broad loss estimate, data improvements can be made. By linking structure value data (e.g., assessed value, replacement value) to parcel or structure footprint data, it would be possible to increase the accuracy of loss estimates. The increased accuracy would provide better information on where to make investments in future mitigation actions.
Priority	High
Funding sources	County funds
Responsible party	Planning; Tax Assessor; Emergency Management
Completion date	4 th quarter of 2006

Strategy 5.3.1. Identify means to coordinate, collect and store damage assessment data in GIS format for each natural hazard event that causes death, injury and or property damage.

format for each natural nazard event that causes death, injury and or property damage.	
Affected Jurisdictions	Pittsylvania County
Category	Emergency Services
Hazard	All hazards
Objective(s) addressed	5.3
Background	Collecting and managing damage assessment information is essential to an effective response and mitigation effort. By determining what happened and what the impacts are, communities are in a better position to respond initially to a disaster and to request additional assistance (e.g., state or federal). GIS systems can be used to effectively manage data and provide maps for emergency response planning and decision-making. This data analysis will help ensure that equipment and personnel can be better used, and assistance can be provided more quickly. This damage assessment information also can be used in future mitigation planning efforts. By capturing locally-specific accurate loss data, future hazard identification and risk assessments can be more detailed and accurate.
Priority	High
Funding sources	Departmental funds, HMGP 5% funds
Responsible party	Emergncy Management, Planning Department, Building Department
Completion date	On-going

Strategy 1.2.3. Incorporate (or continue to incorporate) mitigation principles into local emergency management and recovery plans.	
Affected Jurisdictions	Pittsylvania County
Category	Prevention
Hazard	All hazards
Objective(s) addressed	1.2.
	While mitigation is a phase of the emergency management cycle, it can not be successfully implemented by emergency mangers alone. The departments and agencies involved span planning, public works, economic development, and public safety. For mitigation to be truly successful, it must become part of local planning and decision-making. Mitigation concepts should be (or continue to be) integrated into local

and implicitly.

environment.

High

N/A

On-going

emergency management and recovery plans. As goals,

This mitigation plan can be adopted as an annex to the

that mitigation is considered in the post-disaster

Emergency Management; County Administration

existing Emergency Operations Plan. This will help to ensure

objectives, and strategies are identified for these types of plans, efforts should be made to include mitigation explicit

Background

Priority

Funding sources

Responsible party

Completion date

Strategy 1.2.11. Continue to enforce zoning and building codes to prevent/control construction within the floodplain.

construction within the floodplain.		
Affected Jurisdictions	Pittsylvania County	
Category	Prevention	
Hazard	Flood	
Objective(s) addressed	1.2	
Background	Zoning and building codes are powerful tools used to ensure that development does not occur in hazardous areas and that development is built safely. However, these regulations are only as good as they are implemented.	
	A lack of enforcement of zoning regulations and building inspections is believed to have contributed to the extensive destruction caused by Hurricane Andrew in 1992.	
	Enforcement of zoning and building codes is essential to maintain eligibility for future grants and other financial assistance. In addition, enforcement of the building code contributes to the Building Code Effectiveness Grading Schedule, conducted by the Insurance Services Organization. The score received on this schedule ultimately affects the personal insurance rates in a community.	
Priority	High	
Funding sources	County budget	
Responsible party	Planning and Community Development	
Completion date	On-going	

Strategy 6.4.1. Work with local media outlets to increase awareness of natural hazards. Implement seasonal hazard awareness weeks or days (e.g., hurricane preparedness week, winter weather awareness day).

Affected Jurisdictions	Pittsylvania County
Category	Public Information and Awareness
Hazard	All Hazards
Objective(s) addressed	6.4
Background	A 2004 study sponsored by the American Red Cross and Wirthlin, a survey research firm, found that while Americans recognize the importance of being personally prepared for disaster, fewer than two in ten U.S. adults characterize themselves as very prepared.
	For people to take the steps to become prepared for disaster, they first must be aware of their risk. Media outlets (e.g., television, radio, print) can play an important role in raising awareness and encouraging personal responsibility to minimize the loss of life and property during a disaster.
	Public education campaigns can be tied to specific events (e.g., anniversary of a disaster) or to a particular hazard and time of year (e.g., hurricane preparedness week in the early summer).
Priority	High
Funding sources	FEMA/HMGP 5% funds, VDEM, local government operating budgets, private sources
Responsible party	County Public Information Officer; Emergency Management
Completion date	On-going

Strategy 6.2.2. Encourage purchase of NOAA radios. Provide NOAA weather radios to public facilities.	
Affected Jurisdictions	Pittsylvania County
Category	Public Information and Awareness
Hazard	All
Objective(s) addressed	6.2
Background	NOAA Weather Radio (NWR) continuously broadcasts National Weather Service forecasts, warnings and other crucial weather information. The radios can be programmed to receive information specific to a certain area, using the Specific Area Message Encoder (SAME) feature, and can sound an alarm to alert users of approaching dangerous weather.
	NWR now broadcasts warning and post-event information for all types of hazards, both natural (such as earthquakes and volcano activity) and technological (such as chemical releases or oil spills).
	NWR receivers can be purchased at many retail stores that sell electronic merchandise. Prices can vary from \$20 to \$200, depending on the model. Many receivers have an alarm feature, but some may not. Users should be trained how to use the receivers. In particular, users should learn how to set alerts specific to their area.
Priority	High
Funding sources	National Weather Service (NWS), county budget
Responsible party	Emergency Management

1st quarter of 2006

Completion date

Strategy 7.2.2. Consider participating in the *StormReady* program sponsored by the National Weather Service.

racional weather bervice.	
Affected Jurisdictions	Pittsylvania County
Category	Public Information; Emergency Services
Hazard	All
Objective(s) addressed	7.2
	StormReady is a nationwide community preparedness program that uses a grassroots approach to help communities develop plans to handle all types of severe weather. The town would be interested in being included as part of Pittsylvania County participation. The program has several requirements based on the size of the participating community. The requirements for a community
Background	 the size of Pittsylvania County are: Established 24 hr Warning Point (WP) Establish Emergency Operations Center (EOC) Four (4) ways for EOC/WP to receive NWS warning, etc. Four (4) ways to monitor hydrometerological data Four (4) ways for EOC/WP to disseminate warnings Placing NOAA Weather Radio receivers in public facilities Four (4) annual weather safety talks Train spotters and dispatchers biennially Host/co-host annual NWS spotter training Formal hazardous weather operations plan Biennial visits by emergency manager to NWS Annual visits by NWS official to community
Priority	High
Funding sources	N/A
Responsible party	Emergency Management
Completion date	3 rd quarter of 2006

Strategy 6.2.*. Work on ways to reduce vulnerability of people with disabilities.	
Affected Jurisdictions	Pittsylvania County
Category	Public Information and Awareness
Hazard	All
Objective(s) addressed	6.2
Background	According to Saving Lives: Including People with Disabilities in Emergency Planning, a report developed by the National Council on Disabilities, the concerns of people with disabilities are overlooked during emergencies. According to the Council, the term disability does not apply just to people whose disabilities are noticeable, such as wheelchair users and people who are blind or deaf. The term also applies to people with heart disease, emotional or psychiatric conditions, arthritis, significant allergies, asthma, multiple chemical sensitivities, respiratory conditions, and some visual, hearing, and cognitive disabilities.
	The report goes on to say that typical disaster preparedness and emergency response systems are designed for people without disabilities. In addition, access to emergency public warnings, as well as preparedness and mitigation information and materials, does not adequately include people who cannot depend on sight and hearing to receive their information.
	Pittsylvania County Emergency Management has worked with local service groups, local colleges and City of Danville to provide information and assistance to people with disabilities. Working together, the group provided workshops to help people with disabilities prepare for natural disasters and other emergencies. Continued outreach and assistance is needed to ensure that the vulnerability of people with disabilities in Pittsylvania County is minimized.

Strategy 6.2.*. Work on ways to reduce vulnerability of people with disabilities.	
Priority	High
Funding sources	FEMA/Hazard Mitigation Grant Program (HMGP) 5% funds; local funds
Responsible party	Emergency Management
Completion date	On-going

Town of Boones Mill

Strategy 3.3.4. Investigate, develop and/or implement a channel maintenance program consisting of routine inspections and subsequent debris removal to ensure free flow of water in local streams and watercourses. Identify funding opportunities including partnering with local nongovernmental or volunteer organization.

Affected Jurisdictions	Franklin County; Town of Boones Mill
Category	Structural Project
Hazard	Flood
Objective(s) addressed	3.3
	Waterways should be cleared of debris to allow for the free flow of water during a flood event. If streams or rivers are clogged with debris, damming could occur. As a result, areas upstream and adjacent to the unintended dam can receive unanticipated higher flood levels. In addition, downstream areas may be vulnerable to higher flooding if and when the dam breaks.
Background	Maggodee Creek often floods the Town of Boones Mill and Route 220 (north of the town). Of particular concern is the portion of the creek between the Route 220 bridge and the railroad bridge. In order to reduce the flooding, it may require channel clearing or channel modification. The County and Town will work with Blue Ridge Soil and Water Conservation District to determine the most effective means of reducing the flood.
Priority	High
Funding sources	Grants
Responsible party	Public Safety, Boones Mill town manager, Planning and Zoning and VDOT
Completion date	Estimated start date summer 2006

Town of Chatham

Strategy 1.2.11. Continue to enforce zoning and building codes to prevent/control construction within the floodplain.	
Affected Jurisdictions	Town of Chatham
Category	Prevention
Hazard	Flood
Objective(s) addressed	1.2
Background	Zoning and building codes are powerful tools used to ensure that development does not occur in hazardous areas and that development is built safely. However, these regulations are only as good as they are implemented.
	A lack of enforcement of zoning regulations and building inspections is believed to have contributed to the extensive destruction caused by Hurricane Andrew in 1992.
	Enforcement of zoning and building codes is essential to maintain eligibility for future grants and other financial assistance. In addition, enforcement of the building code contributes to the Building Code Effectiveness Grading Schedule, conducted by the Insurance Services Organization. The score received on this schedule ultimately affects the personal insurance rates in a community.
Priority	High
Funding sources	Town budget
Responsible party	Planning and Community Development
Completion date	On-going

Town of Gretna

Strategy 7.1.1. Obtain official recognition of the mitigation working group/Mitigation Advisory Committee (MAC) from the jurisdictions in the Planning District in order to help institutionalize and develop an ongoing mitigation program. Use the MAC to review mitigation projects and coordinate multi-jurisdictional grant applications.

Affected Jurisdictions	Town of Gretna
Category	N/A
Hazard	All Hazards
Objective(s) addressed	7.1
Background	The Disaster Mitigation Act of 2000 (DMA2K) required local governments to develop and to adopt all hazard mitigation plans to be eligible for certain types of future disaster assistance including funds for mitigation activities.
	The West Piedmont Planning District Commission formed a multi-jurisdictional committee to oversee hazard mitigation planning efforts for the West Piedmont Region. Each of the participating jurisdictions was represented on the committee.
	One way to increase the effectiveness of such committees and ensure long-term plan implementation is to bestow official status to them. In addition, a formalized committee will allow communities to share the workload when implementing regional activities.
	The town of Gretna should appoint an official Town representative to the committee.
Priority	High
Funding sources	N/A
Responsible party	Town Council
Completion date	Immediately following plan approval

Strategy 1.2.11. Continue to enforce zoning and building codes to prevent/control construction
within the floodplain.

within the floodplain.	
Affected Jurisdictions	Town of Gretna
Category	Prevention
Hazard	Flood
Objective(s) addressed	1.2
Background	Zoning and building codes are powerful tools used to ensure that development does not occur in hazardous areas and that development is built safely. However, these regulations are only as good as they are implemented.
	A lack of enforcement of zoning regulations and building inspections is believed to have contributed to the extensive destruction caused by Hurricane Andrew in 1992.
	Enforcement of zoning and building codes is essential to maintain eligibility for future grants and other financial assistance. In addition, enforcement of the building code contributes to the Building Code Effectiveness Grading Schedule, conducted by the Insurance Services Organization. The score received on this schedule ultimately affects the personal insurance rates in a community.
Priority	High
Funding sources	Town budget; County budget
Responsible party	Planning and Community Development
Completion date	On-going

Strategy 4.1.1. Identify need for backup generators, communications, and/or vehicles at critical public facilities. Develop means to address shortfall identified.

public facilities. Develop means to address snortfall identified.	
Affected Jurisdictions	Town of Gretna
Category	Emergency Services
Hazard	All hazards
Objective(s) addressed	4.1
Background	The ability to recover quickly after a disaster rests, in part, on the community's ability to maintain critical functions during response and recovery. An important part of maintaining these critical functions is ensuring that the facilities and resources required are available after a disaster. An inventory and assessment should be completed for community critical facilities (e.g., Emergency Operations Center, Emergency Communications Center, public shelters) that examines the need for backup generators, communications and/or vehicles. Needs should be ranked and a plan developed to address the most critical needs first.
Priority	High
Funding sources	Capital Improvements Program, PDM, FEMA HMGP 5% funds
Responsible party	Town Manager
Completion date	2 nd quarter of 2006

Strategy 4.2.1. Pursue upgrading of water systems to bring additional water sources on-line, to link community systems to provide redundancy, and to provide additional areas with non-well water.

water.	
Affected Jurisdictions	Town of Gretna; Pittsylvania County
Category	Structural Project
Hazard	Drought
Objective(s) addressed	4.2
Background	In order for the town of Gretna to ensure it can continue to meet the water needs of its residents and businesses, especially as the town grows, there is a need to expand the existing water supply system to serve new and existing areas. The current water plant has a capacity of 0.434 million gallons per day (MGD). The reservoir has a capacity of 10 MGD.
	The town is currently working with Pittsylvania County on an estimated \$7 million raw water intake project, partially funded by the U.S. Department of Housing and Urban Development, the Economic Development Administration and the Virginia Tobacco Indemnification and Community Revitalization Commission. The town, along with Pittsylvania County and the other towns in the County, is also pursuing implementation of a regional water system between Chatham, Gretna, and Hurt along Route 29 at an estimated cost of \$3 million.
Priority	High
Funding sources	CDBG; U.S. EPA/State and Tribal Assistance Grant; EDA; Virginia Tobacco Indemnification and Community Revitalization Commission
Responsible party	Water Department (Town); Public Works (County)
Completion date	4 th quarter of 2008

Town of Hurt

Strategy 7.1.1. Obtain official recognition of the mitigation working group/Mitigation Advisory Committee (MAC) from the jurisdictions in the Planning District in order to help institutionalize and develop an ongoing mitigation program. Use the MAC to review mitigation projects and coordinate multi-jurisdictional grant applications.

Affected Jurisdictions	Town of Hurt
Category	N/A
Hazard	All Hazards
Objective(s) addressed	7.1
Background	The Disaster Mitigation Act of 2000 (DMA2K) required local governments to develop and to adopt all hazard mitigation plans to be eligible for certain types of future disaster assistance including funds for mitigation activities.
	The West Piedmont Planning District Commission formed a multi-jurisdictional committee to oversee hazard mitigation planning efforts for the West Piedmont Region. Each of the participating jurisdictions was represented on the committee.
	One way to increase the effectiveness of such committees and ensure long-term plan implementation is to bestow official status to them. In addition, a formalized committee will allow communities to share the workload when implementing regional activities.
	The town of Hurt should appoint an official Town representative to the committee.
Priority	High
Funding sources	N/A
Responsible party	Town Council
Completion date	Immediately following plan approval

Strategy 4.1.2. Consider providing necessary electrical hook-up, wiring, and switches to allow readily accessible connections to emergency generators at key critical public facilities.

readily accessible conflections to enlergency generators at key critical public facilities.	
Affected Jurisdictions	Town of Hurt
Category	Emergency Services
Hazard	All Hazards
Objective(s) addressed	4.1
Background	Weather conditions throughout the year can cause unexpected power outages that affect critical public facilities. These outages can happen during thunderstorms, hurricanes, winter storms and many other events.
	Generators are needed to provide reliable, immediate and full-strength power when primary power systems fail. Standby power is required for health care facilities, operations centers, food storage, essential building operations, correctional and security systems, water pumping stations, and 911 call centers.
	Generator hook-ups allow the county to have a supply of mobile generators that can be assigned based on needs (as opposed to buying a generator for each facility). Installing hook-ups ensures that generators can be used quickly wherever they are sent.
Priority	High
Funding sources	Department of Homeland Security (DHS)/Homeland Security Grant Program (HSGP); Capital Improvements Plan; PDM
Responsible party	Department of Emergency Management, Public Works
Completion date	2 nd quarter of 2006

Strategy 1.1.3. Establish flood level markers along bridges and other structures to indicate the rise of water levels along creeks and rivers in potential flood-prone areas. Work with VDOT and other jurisdictions as needed.

Affected Jurisdictions	Town of Hurt
Category	Public Information; Emergency Services
Hazard	Flood
Objective(s) addressed	1.1
Background	Many of the deaths that occur during flood events occur when people attempt to drive through floodwaters. Roads subject to flooding should be clearly marked with a gauge showing flood depths. There is a need for a flood marker at Pocket Road (Rt. 924).
Priority	High
Funding sources	HMGP, VDOT, City funds
Responsible party	Public Works
Completion date	4 th quarter of 2006

Strategy 1.2.11. Continue to enforce zoning and building codes to prevent/control construction within the floodplain.

within the floodplain.	
Affected Jurisdictions	Town of Hurt
Category	Prevention
Hazard	Flood
Objective(s) addressed	1.2
Background	Zoning and building codes are powerful tools used to ensure that development does not occur in hazardous areas and that development is built safely. However, these regulations are only as good as they are implemented.
	A lack of enforcement of zoning regulations and building inspections is believed to have contributed to the extensive destruction caused by Hurricane Andrew in 1992.
	Enforcement of zoning and building codes is essential to maintain eligibility for future grants and other financial assistance. In addition, enforcement of the building code contributes to the Building Code Effectiveness Grading Schedule, conducted by the Insurance Services Organization. The score received on this schedule ultimately affects the personal insurance rates in a community.
Priority	High
Funding sources	Town budget; County budget
Responsible party	Planning and Community Development
Completion date	On-going

Strategy 7.2.1 Consider participating in the *StormReady* program sponsored by the National Weather Service.

Weather Service.	
Affected Jurisdictions	Town of Hurt
Category	Public Information; Emergency Services
Hazard	All
Objective(s) addressed	7.2
Background	StormReady is a nationwide community preparedness program that uses a grassroots approach to help communities develop plans to handle all types of severe weather. The town would be interested in being included as part of Pittsylvania County participation. The program has several requirements based on the size of the participating community. The requirements for a community the size of Pittsylvania County are: Established 24 hr Warning Point (WP) Establish Emergency Operations Center (EOC) Four (4) ways for EOC/WP to receive NWS warning, etc. Four (4) ways to monitor hydrometerological data Four (4) ways for EOC/WP to disseminate warnings Placing NOAA Weather Radio receivers in public facilities Four (4) annual weather safety talks Train spotters and dispatchers biennially Host/co-host annual NWS spotter training Formal hazardous weather operations plan Biennial visits by emergency manager to NWS Annual visits by NWS official to community
Priority	High
Funding sources	N/A
Responsible party	Public Safety
Completion date	July 2006

Town of Ridgeway

Strategy 4.3.2. Work with VDOT, private utilities, and/or private homeowners to trim or remove trees that could down power lines and block roads.	
Affected Jurisdictions	Town of Ridgeway
Category	Prevention; Natural Resource Protection
Hazard	Wind; winter storm
Objective(s) addressed	4.3
Background	Severe wind and heavy ice or snow loads can bring down tree limbs or entire trees. Trees are particularly vulnerable if they have been recently impacted by drought or previous storm events.
	An aggressive tree trimming and removal program should be undertaken to ensure that power line right of ways are clear of potential hazards. A system to identify trees with structural weaknesses should be developed. In addition, a means to communicate between responsible parties should be established so that potential problem spots can be addressed as they are identified by town and other staff.
	Because tree trimming may affect the existing tree canopy and resulting community appearance, it may require a public education campaign to explain the need for a tree trimming program.
Priority	High
Funding sources	Public/Private partnerships, Local funds
Responsible party	Town Manager, Dominion Power, Comcast, Verizon, VDOT
Completion date	On-going

Strategy 6.3.2. Work with mobile home parks to identify and publicize nearby shelters for residents.	
Affected Jurisdictions	Town of Ridgeway
Category	Public Information and Awareness
Hazard	Wind
Objective(s) addressed	6.3
Background	Manufactured and mobile homes can be dangerous locations during a natural disaster. These structures can be particularly vulnerable to wind and flood damage. Mobile home parks may provide community shelters, or permanent structures that can be used to provide a safe place to go to for residents during a high wind or other event. The town will work with mobile home owners and residents to ensure that residents know where shelter can be found during a natural disaster. This effort may include identifying county shelters that might be opened.
Priority	High
Funding sources	Local funds
Responsible party	Town Manager
Completion date	2 nd quarter of 2006

Strategy 1.2.11. Continue to enforce zoning and building codes to prevent/control construction.	
Affected Jurisdictions	Town of Ridgeway
Category	Prevention
Hazard	All
Objective(s) addressed	1.2
Background	Zoning and building codes are powerful tools used to ensure that development does not occur in hazardous areas and that development is built safely. However, these regulations are only as good as they are implemented.
	A lack of enforcement of zoning regulations and building inspections is believed to have contributed to the extensive destruction caused by Hurricane Andrew in 1992.
	Enforcement of zoning and building codes is essential to maintain eligibility for future grants and other financial assistance. In addition, enforcement of the building code contributes to the Building Code Effectiveness Grading Schedule, conducted by the Insurance Services Organization. The score received on this schedule ultimately affects the personal insurance rates in a community.
Priority	High
Funding sources	Town budget
Responsible party	Planning and Community Development
Completion date	On-going

Strategy 6.2.1. Distribute information packets to raise awareness regarding the risks present in the West Piedmont region and to provide disaster preparedness information.

	provide disaster preparedness information.
Affected Jurisdictions	Town of Ridgeway
Category	Public Information and Awareness
Hazard	All Hazards
Objective(s) addressed	6.2
Background	The Town of Ridgeway is prone to wind, winter storms and other severe weather. It is imperative that residents are informed of preparedness information on how to prepare for the impacts of natural hazards. In addition, it is important to remind the population of the area that may have become complacent about the hazards and how to prepare for them. Key messages include whom to call for information in the event of an impending disaster or after a disaster, what things to include in a disaster preparedness kit and simple hazard specific mitigation measures each resident can take to reduce their risk. Other topics may include: flood insurance (including Increased Cost of Compliance coverage); sewer back-up insurance; potential wind-borne debris; sheltering in place.
Priority	High
Funding sources	FEMA/Hazard Mitigation Grant Program (HMGP) 5% funds; business community sponsors
Responsible party	Town manager/mayor
Completion date	On-going

Strategy 6.2.2. Encourage purchase of and training on the use of NOAA radios. Provide NOAA weather radios to public facilities.

weather radios to public facilities.	
Affected Jurisdictions	Town of Ridgeway
Category	Public Information and Awareness
Hazard	All
Objective(s) addressed	6.2
Background	NOAA Weather Radio (NWR) continuously broadcasts National Weather Service forecasts, warnings and other crucial weather information. The radios can be programmed to receive information specific to a certain area, using the Specific Area Message Encoder (SAME) feature, and can sound an alarm to alert users of approaching dangerous weather.
	NWR now broadcasts warning and post-event information for all types of hazards, both natural (such as earthquakes and volcano activity) and technological (such as chemical releases or oil spills).
	NWR receivers can be purchased at many retail stores that sell electronic merchandise. Prices can vary from \$20 to \$200, depending on the model. Many receivers have an alarm feature, but some may not. Users should be trained how to use the receivers. In particular, users should learn how to set alerts specific to their area.
Priority	High
Funding sources	National Weather Service (NWS), county budget
Responsible party	Town manager

Strategy 6.2.5. Educate residents and business owners about reducing possible wind-borne debris.	
Affected Jurisdictions	Town of Ridgeway
Category	Property Protection
Hazard	Wind
Objective(s) addressed	6.2
Background	Wind-borne debris can cause major damage during a high wind event such as a hurricane or tornado. The steps to reduce such debris can be fairly simple and inexpensive. Such steps may include anchoring storage sheds, moving outdoor furniture indoors, and trimming trees.
Priority	High
Funding sources	HMGP 5% funds; local funds
Responsible party	Town manager
Completion date	4 th quarter of 2006

Town of Rocky Mount

Strategy 4.3.1. Initiate (or encourage) road clearing efforts early in wind and winter storms.
Develop plan for quick deployment of road clearing equipment.

Develop plan for quick deployment of road clearing equipment.	
Affected Jurisdictions	Town of Rocky Mount
Category	Emergency Services
Hazard	Wind; winter storm
Objective(s) addressed	4.3
Background	Wind and winter storms can create tremendous amounts of debris which can block roads shutting down a community. Blocked roads also make it difficult for emergency vehicles to respond to disaster and to non-disaster related emergencies (e.g., 911 calls). The town should develop a plan for working with VDOT to ensure that roads are cleared quickly after an event to minimize the amount of time that the transportation network is shut down.
Priority	High
Funding sources	N/A
Responsible party	Town manager; Public Works
Completion date	On-going

Strategy 2.1.1. Investigate providing technical assistance for property owners to implement mitigation measures (i.e., strengthening building frame connections; elevating appliances, constructing a wind shelter).

Affected Jurisdictions	Town of Rocky Mount
Category	Property Protection; Public Information and Awareness
Hazard	Flood
Objective(s) addressed	2.1
Background	A variety of mitigation techniques can be undertaken by homeowners to improve the resistance of their properties to natural hazards. The Town could develop a program to provide one-on-one technical assistance to homeowners to teach them how to implement mitigation measures in their homes. This program could include working with the County building department to distribute copies of existing publications that contain information on how to strengthen and repair homes.
Priority	High
Funding sources	HMGP 5%, local funds
Responsible party	Planning, Public Safety
Completion date	4 th quarter of 2008

Strategy 4.2.1. Pursue upgrading of water systems to bring additional water sources on-line, to link community systems to provide redundancy, and to provide additional areas with non-well water.

Affected Jurisdictions	Town of Rocky Mount
Category	Structural Project
Hazard	Drought
Objective(s) addressed	4.2
Background	The town currently provides public water to residents within town limits. The existing water treatment plant is a Class II facility with 2.0 MGD capacity with expansion capabilities. The town and Franklin County are interested in working together to expand the reach of the system beyond the town limits. Expansion of the existing system's capacity may be needed if additional areas are brought on-line.
Priority	High
Funding sources	CDBG; U.S. EPA/State and Tribal Assistance Grant; EDA
Responsible party	Water Department (Town); Public Works (County)
Completion date	4 th quarter of 2008

Strategy 5.2.1. Identify training opportunities for staff to enhance their ability to use GIS for emergency management needs.

emergency management needs.	
Affected Jurisdictions	Town of Rocky Mount
Category	Emergency Services
Hazard	All hazards
Objective(s) addressed	5.2
Background	Emergency managers collect and manage a vast quantity of data before, during and after disasters. Much of this information comes from other departments and agencies and has a spatial component. Geographic Information Systems (GIS) provide a means to manage and share these datasets.
Priority	High
Funding sources	Departmental funds, FEMA
Responsible party	Planning and Zoning; Public Safety
Completion date	1st quarter of 2007

Strategy 5.2.2. Provide training opportunities to local zoning and building code enforcement staff. Educate them re: damage assessment, mitigation techniques, and other related topics.

	socionieno, minigation teeninques, una other related topics.
Affected Jurisdictions	Town of Rocky Mount
Category	Local Capacity
Hazard	All
Objective(s) addressed	5.2
Background	One key to successful enforcement of floodplain and other regulations is to ensure that staff are adequately trained and have the opportunity to learn about new standards and techniques. It is especially important that staff understand how damage assessments are conducted by state and federal officials. In addition, enforcement staff should be comfortable in making substantial damage determinations. Potential class topics could include: - Damage assessment - Substantial damage requirements - Floodproofing techniques
Priority	High
Funding sources	Town funds; VDEM
Responsible party	Public Safety
Completion date	December 2005

Town of Stuart

Strategy 4.1.1. Identify need for backup generators, communications, and/or vehicles at critical
public facilities. Develop means to address shortfall identified.

public facilities. Develop means to address shortfall identified.	
Affected Jurisdictions	Town of Stuart
Category	Emergency Services
Hazard	All hazards
Objective(s) addressed	4.1
Background	The ability to recover quickly after a disaster rests, in part, on the community's ability to maintain critical functions during response and recovery. An important part of maintaining these critical functions is ensuring that the facilities and resources required are available after a disaster. An inventory and assessment should be completed for community critical facilities (e.g., Emergency Operations Center, Emergency Communications Center, public shelters) that examines the need for backup generators, communications and/or vehicles. Needs should be ranked and a plan developed to address the most critical needs first.
Priority	High
Funding sources	Capital Improvements Program, PDM, FEMA HMGP 5% funds
Responsible party	Town Manager
Completion date	2 nd quarter of 2006

Strategy 2.1.2. Identify existing flood-prone structures that may benefit from mitigation measures such as elevation or floodproofing techniques.

measures such as elevation or floodproofing techniques.	
Affected Jurisdictions	Town of Stuart
Category	Property Protection
Hazard	Flood
Objective(s) addressed	2.1, 1.3
Background	Three repetitive loss properties are located within the town limits of Stuart. These are the only repetitive loss properties in Patrick County.
	The town should work with the County and the State to use GIS and past damage information to identify specific properties that may benefit from property protection measures. These measures include relocation or elevation. Dry or wet floodproofing may be options for non-residential structures. Other measures, such as elevation of appliances such as heating/air conditioning units, also may be appropriate.
	Of particular concern is the downtown area of Stuart and the Nevermar area. There are numerous culverts under structures. These culverts may be at risk of failure, which could cause the collapse of the buildings above them. The town should monitor the status of the culverts.
Priority	High
Funding sources	FEMA HMGP; FEMA PDM; Community Development Block Grant/Virginia Disaster Recovery Program
Responsible party	Town manager
Completion date	2 nd quarter of 2007

Strategy 3.2.3. Implement a program to seal and vent or raise sewer system components (i.e., manhole covers that are located in the 100-year flood plain or other areas identified as highly probable for flooding).

Affected Jurisdictions	Town of Stuart
Category	Structural Projects
Hazard	Flood
Objective(s) addressed	3.2
Background	To maximize efficiency, sewer systems should be watertight and designed to minimize infiltration of stormwater. For example, manhole covers should be elevated above the Base Flood Elevation to reduce the risk that floodwaters would breach the manhole and overwhelm the sanitary sewer system. In addition, waste treatment facilities, including pumping stations, lagoons, and treatment plants should be floodproofed.
Priority	High
Funding sources	CDBG; U.S. EPA/State and Tribal Assistance Grant
Responsible party	Town manager; Public Works
Completion date	4 th quarter of 2008

Strategy 4.1.2. Consider providing necessary electrical hook-up, wiring, and switches to allow readily accessible connections to emergency generators at key critical public facilities.

	emergency generators at key efficient public facilities.
Affected Jurisdictions	Town of Stuart
Category	Emergency Services
Hazard	All Hazards
Objective(s) addressed	4.1
Background	Weather conditions throughout the year can cause unexpected power outages that affect critical public facilities. These outages can happen during thunderstorms, hurricanes, winter storms and many other events.
	Generators are needed to provide reliable, immediate and full-strength power when primary power systems fail. Standby power is required for health care facilities, operations centers, food storage, essential building operations, correctional and security systems, water pumping stations, and 911 call centers.
	Generator hook-ups allow the county to have a supply of mobile generators that can be assigned based on needs (as opposed to buying a generator for each facility). Installing hook-ups ensures that generators can be used quickly wherever they are sent.
Priority	High
Funding sources	Department of Homeland Security (DHS)/Homeland Security Grant Program (HSGP); Capital Improvements Plan; PDM
Responsible party	Town Manager
Completion date	2 nd quarter of 2006

Section VIII. Plan Maintenance Procedures

The long-term success of the West Piedmont Planning District's mitigation plan depends in large part on routine monitoring, evaluating, and updating of the plan so that it will remain a valid tool for the communities to use.

Formal Plan Adoption

Thirteen local governments in south-central Virginia participated in this planning process and formally adopted this plan by resolution of their governing Board. These local governments are the counties of Franklin, Henry, Patrick and Pittsylvania; the cities of Danville and Martinsville; and the towns of Chatham, Boones Mill, Gretna, Hurt, Ridgeway, Rocky Mount and Stuart.

The plan was completed under the auspices of the West Piedmont Planning District Commission. Sample adoption language was provided to the participating jurisdictions to facilitate the adoption process (see Appendix A).

The adoption process itself took several months, as significant coordination by the Mitigation Advisory Committee was necessary in order to 1) place the plan review and adoption on the appropriate meeting agendas in each jurisdiction, 2) produce and provide copies in official meeting packets, 3) facilitate the actual adoption, 4) collect the adoption resolutions, and 5) incorporate the adopted resolutions into the final Hazard Mitigation Plan.

The West Piedmont Planning District Commission appreciates the willingness that both Virginia Department of Emergency Management and FEMA Region III have demonstrated by reviewing this plan concurrently and providing comments for revision *prior* to the adoption process. Not having done so would clearly have added more months to the adoption process.

Implementation

Upon adoption, the plan faces the biggest test: *implementation*. While this plan puts forth many worthwhile and "High" priority recommendations, the decision of which action to undertake first will be the primary issue that the West Piedmont Planning District communities face.

Funding is always an important and critical issue. Therefore, pursuing low or no-cost high-priority recommendations may be one approach that a community chooses to take. An example of a low-cost, high-priority recommendation would be to install flood level markers on bridges to warn of high water levels.

Another implementation approach is to prioritize those actions that can be completed in a relatively short amount of time. Being able to publicize a successful project can build momentum to implement the other parts of the plan. An example of an effective but easy-to-implement strategy is to participate in the National Weather Service's *StormReady* program.

It is important to the long-term implementation of the plan that the underlying principles of this Hazard Mitigation Plan are incorporated into other community plans and mechanisms, such as:

- Comprehensive Planning
- Capital Improvement Program Budgeting

The capability assessment section of this plan provides insight into the current comprehensive plans for each community. Communities will work to ensure that the appropriate information from this plan is incorporated into the next update of their comprehensive plan. Information from the hazard identification and risk assessment as well as mitigation goals and strategies may be directly included as a comprehensive plan element or will be included in other elements, as appropriate. Projects that require large investments, such as acquisition or road retrofits are candidates for inclusion in capital improvement plans.

Mitigation is most successful when it is incorporated within the day-to-day functions and priorities of government and development. This integration is accomplished by a constant effort to network and to identify and highlight the multi-objective, "winwin" benefits to each program, the communities and their constituents. This effort is achieved through monitoring agendas, attending meetings, and sending memos.

Simultaneous to these efforts, it will be important to constantly monitor funding opportunities that can be utilized to implement some of the higher cost recommended actions. This will include creating and maintaining a repository of ideas on how any required local match or participation requirement can be met. Then, when funding does become available, the West Piedmont Planning District communities will be in a position to take advantage of an opportunity. Funding opportunities that can be monitored include special pre- and post-disaster funds, special district budgeted funds, state or federal ear-marked funds, and grant programs, including those that can serve or support multi-objective applications.

With adoption of this plan, the West Piedmont Planning District communities commit to:

- Pursuing the implementation of the high-priority, low/no-cost recommended actions.
- Keeping the concept of mitigation in the forefront of community decisionmaking by identifying and stressing the recommendations of the Hazard Mitigation Plan when other community goals, plans and activities are discussed and decided upon.
- Maintaining a constant monitoring of multi-objective, cost-share opportunities to assist the participating communities in implementing the recommended actions of this plan for which no current funding or support exists.

In addition, the communities of the West Piedmont region remain committed to the National Flood Insurance Program. They will continue to enforce floodplain regulations and undertake other actions to remain in compliance with the program.

Maintenance

Plan maintenance requires an ongoing effort to monitor and evaluate the implementation of the plan, and to update the plan as progress, roadblocks, or changing circumstances are recognized.

The county administrator, city manager, or town manager will be responsible for appointing one or more representatives (e.g., emergency coordinator, planning director) to a group convened by the West Piedmont Planning District Commission. It is expected that the group convened by the Planning District Commission will function as an adjunct to the Regional Emergency Managers Group that already meets on a regular basis. This working group will be responsible for monitoring and updating the plan; as such the working group will want to develop the following:

- Annual progress reports from each jurisdiction on their Mitigation Action Plan,
- An annual review by the working group, and
- A 5-year written update to be submitted to the state and FEMA Region III, unless disaster or other circumstances (e.g., changing regulations) lead to a different time frame.

The Executive Director of the West Piedmont Planning District Commission will be responsible for monitoring this plan. The working group representative from each jurisdiction will make annual updates to the West Piedmont Planning District Commission on the progress of the implementation of their Mitigation Action Plans. The timing of the yearly reports should coincide with either the anniversary of the approval date of this plan or another date chosen by the committee, such as predetermined meeting of the Regional Emergency Managers Group. The annual

progress reports will be reviewed by the working group who will determine what action is needed.

The working group will be responsible for setting annual measures of success and a five-year measure of success for each strategy. These indicators can be used to measure the progress and success of implementation of the mitigation plan. The working group can use this information to determine if corrective action is needed. In addition, the working group should review its composition annually and add members if needed.

The working group will determine at the annual meeting if an update of the plan is needed. At a minimum, the plan will be updated every five years. Factors to consider when determining if an update is necessary include:

- Decreased vulnerability as a result of implementing recommended actions,
- Increased vulnerability as a result of failed or ineffective mitigation actions, and/or,
- Increased vulnerability as a result of new development (and/or annexation).
- New state/federal laws, policies, or programs
- Changes in resource availability
- Applicability of goals/objectives/strategies

A major event, such as a Presidentially-declared disaster, may trigger a need to review the plan. If such an event occurs in the West Piedmont region, the working group will coordinate to determine how best to review and update the plan. The updating of the plan will be by written changes and submissions, as the West Piedmont Planning District communities and the working group deem appropriate and necessary. Major changes to the plan will be submitted to the state and to FEMA Region III.

Public notice will be given and public participation will be invited, at a minimum, through available web postings and press releases to the local media outlets, primarily newspapers and radio stations. In addition, an annual event will be held to publicize progress on implementing the mitigation plan. This event could be timed to coincide with the anniversary of a significant event or annual awareness event (i.e., Hurricane Preparedness Week). Jurisdictions also should provide annual updates to the governing body to keep them informed about plan implementation.

Evaluation of progress can be achieved by monitoring changes in the vulnerability identified in the plan. Changes in vulnerability can be identified by noting:

- Lessened vulnerability as a result of implementing recommended actions,
- Increased vulnerability as a result of failed or ineffective mitigation actions, and/or,
- Increased vulnerability as a result of new development (and/or annexation).

Updating of the plan will be by written changes and submissions, as the West Piedmont Planning District communities and the working group deem appropriate and necessary.

Section IX. References

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Mitigation Plans

- Cumberland Mitigation Plan
- New River Valley (VA) Mitigation Plan
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- Wyoming County (WV) Mitigation Plan

Websites

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- Natural Gas Supply Association. *The Transportation of Natural Gas*. http://www.naturalgas.org/naturalgas/transport.asp
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- US EPA. *Envirofacts Data Warehouse*. http://oaspub.epa.gov/enviro/ef_home2.toxics
- Virginia Department of Forestry. <u>www.dof.virginia.gov</u>
- Virginia Department of Mines, Minerals, and Energy. *Virginia Energy Patterns and Trends. Virginia Natural Gas.*http://www.energy.vt.edu/vept/naturalgas/index.asp

Software

- Data provided by communities
 - o Danville City
 - o Henry County

- o Franklin County
- o Martinsville City
- Patrick County
- Pittsylvania County
- ESRI data and software
- FEMA Flood Insurance Study for community descriptions and flooding/hurricane events
- FEMA Hazards US (HAZUS) software
- National Climatic Database Center
- National Inventory of Dams, US Army Corps of Engineers
- NOAA
- VirginiaView Parameter-elevation Regressions on Independent Slopes Model data

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